COMPUTERWORLD

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Contracts Weakened by Poorly Defined DP Words

By David H. Greenberg
Special to Computerworld

It is interesting that in an industry where programming has reached such a high degree of competency, and programming language has become super-sophisticated, the ability to talk to the computer and have a mutuality of understanding far exceeds the ability of humans involved to talk to each other and have a mutuality of understanding.

The user thinks if a contract is long and confusing, then it must be valid and enforceable.

Lawyers think if a data processing term is used as a word of art within the industry, it must have a definite meaning.

These two misconceptions are basically why a substantial number of computer hardware and software contracts are found invalid and unenforceable.

Mean the Same

For a contract to be enforceable, the parties must have agreed to the same thing. Therefore, the words used in the agreement must mean the same to both parties. Words used ordinarily in the every day world are interpreted by the courts to have their usual and customary meaning.

Words used as words of art, that is, a word applicable to a certain industry, are interpreted by the courts to have their usual and customary meaning within the particular industry, without a definition of the word within the contract itself.

Many contracts within the computer industry use such words as downtime, software, hardware, systems analyst, senior programmer, maintenance, etc. without specifically defining these terms.

'False Assumption'

These words are used constantly by people in the industry and appear to the attorney as words of art which he therefore assumes have definite meanings within the industry. Yet, these words do not have clearly definable definitions. Let's take a few of these words of art and see if we all agree on what they mean.

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Security Breached

Punched cards listing shareholders and their holdings were the prizes sought by ambitious brokers after New Year celebration in Los Angeles financial district. The cards, mixed with the confetti and ticker tape, belonged to a firm specializing in proxy solicitations. (Wide World Photos)

County DPers Suspended For Private Enterprise

By Edward J. Bride
Of the CW Staff

WATERTOWN, N.Y. — The county director of data processing and half his staff, including the lead programmer, have been suspended for operating a service bureau in the Jefferson County DP Center.

The director has pleaded guilty to "theft of services," a misdemeanor, and has been fined $500, according to District Attorney William J. McCluskey.

The county employees were providing computer services to local industry during and after working hours, McCluskey said. "I can see how easy it could be," he commented. "The confidence was placed" in one man, McCluskey said of DP Director Arthur J. Gardner, who has been suspended from his $14,000 a year job. "Nobody else knew what was going on," the district attorney added.

The operation began last March and, in two months, Gardner, several keypunch operators and the lead programmer had chalked up 250 hours of illegal computer time for a local industry, local investigations revealed. The "customer" was not charged as an accessory, McCluskey stated, since there was every indication that the customer thought Gardner had obtained the necessary clearances to provide the DP service.

Instead, he was running a private business, partly on county time, partly on overtime, McCluskey said, with the government paying full salaries and the employees splitting the fees charged Beaverite, a loose leaf binder firm.

Gardner was charged originally with a felony, arising from alleged falsifying of the pay records, and with the misdemeanor stemming from the illegal providing of computer time, or "theft of services."

Felony Charge Dropped

The felony charge was dropped, and Gardner was allowed to plead guilty to theft of services, the district attorney said.

Charges against the programmer and

(Continued on Page 4)

Cities, States Not Happy With FBI Data Bank Rules

By E. Drake Lundell Jr.
Of the CW Staff

WASHINGTON, D.C. — A battle is shaping up between the Federal Bureau of Investigation and agencies on the state and local levels over the control and management of police systems tied into the FBI's new National Criminal History System data bank.

Several organizations and "hundreds" of individual localities have complained recently that new FBI security regulations only lead to waste, with no security improvements.

The regulations require any computer handling criminal histories be dedicated to law enforcement use and under the control and management of law enforcement officials.

This, according to critics of the regulation, prohibits states and cities from using shared systems where law enforcement applications would be only one part of the systems.

For example, critics say that under the regulations a system could not be used for payrolls, voter registration, etc. if it was also used for police work and linked to the National Criminal History System.

The FBI regulations were promulgated by administrative action, but there is legislation pending in both the House and the Senate to make the regulations law.

Senate bill 2546 states in Section 4 that

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On the Inside

House Vote on Privacy Committee Expected to Be 'Extremely Close'

By a CW Staff Writer

WASHINGTON, D.C. — The House vote on the establishment of a Select Committee on Privacy, Human Values and Democratic Institutions later this month is expected to be "extremely close," informed sources said last week.

One of the major purposes of the proposed group would be to look into the data bank activities of various governmental agencies and private organizations to spotlight actual and potential abuses of individual privacy.

It would also recommend legislation to regulate computerized data banks which pose a threat to privacy and recommend guidelines to safeguard personal information in such systems.

Growing Support

While the vote is expected to be close, in recent weeks a groundswell of opinion supporting the measure has reached the House Rules Committee, which will report the legislation to the floor of the House for the vote.

Favorable opinions have also been received by Rep. Cornelius E. Gallagher (D.-N.J.) who is sponsoring the bill and who formerly headed the Subcommittee on Privacy before it was abolished by the Committee on Government Operations.

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★ Special Report: Changing Data Services (Page 10)

D.C.'s Law Enforcement System Victim of Ills, Competition

By E. Drake Lundell Jr.
Of the CW Staff

WASHINGTON, D.C. – One of the nation's earliest and most ambitious regional law enforcement networks is radically changing direction from a regional system to a local one, due to both internal problems and competition from newer systems.

Ironically, at the same time, the Washington Area Law Enforcement System (Wales) seems to have solved many of its major problems and to have become a more useful tool of the local law enforcement agencies.

The Wales system, inaugurated in 1968, was designed as a prototype system to show the advantages of regional cooperation in law enforcement activities.

The system, sponsored by the Metropolitan Washington Council of Governments, was developed to provide a method of interchanging such information as wanted persons, stolen cars, parole data and misdemeanor warrants between the District of Columbia and suburban police departments in Maryland and Northern Virginia. It was initially funded, in part, by the Law Enforcement Assistance Administration.

Under present plans, however, the system will be primarily used almost solely by the D.C. police.

Instead of being a model of the perfect system, however, most participants now feel that Wales could be a model of how not to develop effective law enforcement systems.

As in many applications, the Wales system was initially oversold to the suburban departments that were to tie into it and the suburban "jurisdictions were promised a lot of things that couldn't be delivered," according to Inspector Theodore E. King, who now manages the system for the Metropolitan Washington Police Department.

In addition, the system was underfunded since its inception, he said. It was originally set up with a $280,000 grant from he Law Enforcement Assistance Administration, but since the original grant ran out it has been funded almost totally by the District Police Department.

The outlying jurisdictions tied into the system have only had to pay for the rental of terminals and communication costs and have not had to pay for use or for programming the system.

The system was also originally supposed to run on a dedicated computer system, but due to budgetary limitations had to be run on a shared system, with access limited to certain times of the day.

The original contractor of the system "tried to do too much too fast," King said.

"This was one of the first if not the first" system of its type and there were no examples of effective systems in operation when it was started, he said. Because the original contractor tried to build a total system all at once instead of with modular parts, much of the work has had to be redone or scrapped, he said.

Another problem is that the system was "designed as a prototype and not an operating system," but was used for operations almost from the start, he said.

The major problem with the system is that the outlying jurisdictions – which could be as much as 60 miles from the center of D.C. – could not enter or delete information in the system from their headquarters, but rather they had to carry punched cards to the central computer site to update the system.

Because of this, some of the information in the system was out of date causing confusion and the possibility of re-arresting people.

According to Capt. Alvin Fuchsman of the Arlington Police Department there have been cases where officers have stopped cars reported as stolen only to find them driven by their owners, having been recovered in another jurisdiction and not deleted from the Wales files.

"This would happen in any system where one department puts a report in and fails to cancel it when it is no longer valid," he said. But, he added, it was particularly difficult to update the Wales files since all data had to be hand carried to the District center.

"Wales served a useful purpose, but it is more oriented to the District," according to Sgt. Douglas Flowers of the Alexandria Police Department, who also noted the possibility of re-arrest by the use of information that was old in the Wales files.

King admitted that the system was primarily centered on the District police department, but emphasized that it was paying for most of the cost of the system.

King also said the system had been plagued by downtime when it first began operation, noting that at that time downtime could run up to 50% of the useable time of the system.

But now, King said, the system has been reworked and has been operating better than 95% of the time in recent months.

The main advantage the local police departments found with the system was that it allowed them to access the FBI's National Crime Information Center, something not available elsewhere.

But now both Virginia and Maryland have established statewide systems that are linked to NCIC and all of the police departments in those states can now access it through the new systems.

Wales Nabs Wrong Man

WASHINGTON, D.C. – One citizen here now wishes that the District's computer system had been out of operation when he was stopped by the police and mistaken for a wanted felon who had the same name.

James H. Gray was held for 10 days by the District police because he was confused with another James Gray wanted on a burglary charge.

Gray was arrested Nov. 19 and the arresting officer checked with the central computer, which told him Gray was wanted. He protested that he was the wrong James Gray, but was held nevertheless until he convinced a probation officer that he was the wrong man.

The probation officer contacted Judge C.W. Halleck of the D.C. Superior Court who released Gray with his personal apologies and blasted the police for the foulup. In the meantime, Gray has lost his job and been evicted from his apartment.

A source in the police department said that the error was a human one and not a "computer error." He said that obviously someone had not entered enough identifying information into the system.

In addition, he said that all entries in the system carry a note for the police to contact the agency that issued the warrant or request for arrest to identify the people arrested.

Poor Definitions Weaken DP Contracts

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Downtime or Running Time – Are we talking about clock time or meter time? If we're talking about meter time, are we talking about batch time? What about time-sharing time? At least one big million dollar lawsuit has reached the appellate courts based on this very point. Downtime, and the method of computing it, has been the focal point of numerous lawsuits. Remember, the issue is only what is downtime, not what has caused it.

Software – If you think everyone knows what this means, look in a dictionary. Ask 10 people in the business for a definition and you'll get 10 different answers.

Imagine a contract that agrees to provide software with a computer without further definition. Then imagine trying to explain to a judge exactly what you mean. Then prove that what you mean is what the buyer understood.

Systems Analyst of Senior Programmer – How many programming contracts call for supplying a systems analyst or senior programmer without a specific definition of these terms? Yet there is no universally accepted definition of these terms.

Until a formal governing body is established to determine specific qualifications in order to qualify for these titles, anyone with any experience and any education can call himself a systems analyst or senior programmer. How meaningful then is a contract that calls for providing a systems analyst or senior programmer?

Hardware – If we all do not agree on what software means, how can we agree on what hardware means? Software and hardware are so intertwined that a failure of the hardware is frequently attributable to the software and vice versa. It is difficult then to put blame on the hardware supplier when the software supplier is a different entity.

Maintenance – This problem has been compounded since unbundling. In addition, a user can have so many different pieces of equipment from different manufacturers attached to his mainframe. Again, software is an integral part of the hardware. If the responsibility for maintenance is not in one company, there is a difficult problem in determining where one's responsibility ends and another begins.

These are certainly not the only areas where a computer-related contract can fail in definition of terms.

It is clear, however, that when people within the industry do not have universally accepted definitions for their terms, then lawyers and judges are hard put to convey the mutuality necessary for enforceability of the contract.

If users within the industry do not have a universally accepted standard for their job titles, how then can lawyers and judges know who is a senior programmer?

But in the meantime, and until industry standards of definitions are promulgated, contracts should define the "words of art" used therein.

David H. Greenberg is an attorney in Beverly Hills, Calif., and has represented computer companies and clients against computer companies.

House Privacy Committee Vote Due

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Important support has been received from Sen. Sam J. Ervin (D.-N.C.), whose backing is expected to help sway southern representatives in favor of the measure, the sources said.

The support for the bill offered by Rep. Frank Horton (R.-N.Y.) has also given the act a bipartisan flavor which is expected to help its chances when it comes up for a vote.

In announcing his support for the measure, Horton told the House: "Programs which threaten privacy are advanced by people who are largely indifferent to partisan politics, who propose to spend millions of public dollars, and who are seldom if ever identified in the same way men in public life are held accountable for their decisions.

"It may well be that a major task of the select committee would be to give visibility to certain bureaucratic suggestions before they become issues which could divide Republican from Democrat and liberal from conservative," he said.

At present, Congressional sources indicate the Democratic leadership in the House is solidly behind the measure and the Republican leadership has indicated it will not oppose the creation "as a matter of policy."

So while the vote is still expected to be close, most sources here are betting the bill will be passed.

'Better Price/Performer'

Firm Welcomes Leased 360/50 as 145 Replacement

By E. Drake Lundell Jr.
Of the CW Staff

WATERTOWN, Mass. – In a case of "off with the new and on with the old," Keydata Corp. is replacing its IBM 370/145 with an IBM 360/50 – and saving money in the process.

And while several users have found they could replace two 360 systems with one 370, Keydata officials are contemplating replacing one 370 with two 360s – and achieving increased throughput for the same price.

The Keydata case does not mean entirely replacing a 145 with a 50, John Gilmore, president, said, since the "business computer utility" firm is placing a greater workload on its Univac 494 at the same time.

By taking some of the applications off the 370 system, the firm was able to go back to the 360, he said.

But at the same time, the move does indicate how users can cut their monthly rental costs without degrading performance.

Keydata is leasing its 360/50 from Itel, for between "50% to 65%" of the IBM rental rate for 50s, Gilmore said. This gives the firm a savings of over $5,000 a month from the IBM 360/50 rental rate, he said.

The savings over the IBM rental rate of the 370/145 run around $6,000 per month, Keydata officials explained.

The firm found the 370/145 gave it about a 50% throughput increase for about a 4% price increase over the 360/50 – if it just considered the IBM rental prices. However, the lease rates available from the independent leasing companies make the 50 a better price/performance competitor, the firm said.

"We have been able to prove in the majority of cases that a 50 leased from a third party is a 20% to 25% better price/performer than the 145," according to Joe D. Foster, vice-president for marketing at Itel's computer leasing division, who sold the Keydata installation.

Spotlight On User's Lib

If the 145 gives 50% better performance than the 50 for about the same price, the price/performance ratio is 3 to 2 in favor of the 145 according to John Hermistone, general manager of computer operations at Keydata.

But since the lease rates for the 50s from third-party leasing companies have fallen to approximately 50% to 60% of the rental rates from IBM, it is now possible to get two 360/50s for approximately the same cost of one 145, he said.

This tips the scale in favor of the dual 50 operation – with a 4 to 3 price/performance ratio over the 145.

In addition, a dual operation offers the user many other advantages, Hermistone said, adding the major advantage was one of backup. With two systems, he said, it is obvious that a failure in one will not put the entire operation down while corrections are being made.

Another advantage of the leased systems as opposed to those rented directly from IBM, according to Hermistone, is that the user does not have to pay for overtime usage.

Therefore, he said, a user can tell exactly what his equipment charges will be every month, no matter how much he uses the system.

In the case of Keydata, the overtime charges for the 370/145 were running at an average of $2,000 to $3,000 per month, he said, all of which has been eliminated by going to the leased 360.

So even if the firm decided to go to a dual leased configuration – at about the same cost of a 145 rented from IBM – it would have overtime savings, he said.

In total, Keydata has been able to reduce its monthly rental costs by around $13,000 a month by replacing its 145 with a 50.

If the firm decides later to go to the dual 50 configuration, the savings would drop to around $36,000 yearly – not bad when it will get a throughput improvement of 25% over the 145 configuration at the same time.

Ford Finds a Way To Better Predict Trucks' Behavior

WASHINGTON, D.C. – A computer program developed by the National Aeronautics and Space Administration is playing a substantial part in the design of new models of light trucks and passenger cars.

Nastran, a Nasa-developed general-purpose digital computer program originally designed to analyze the behavior of elastic structures in the space program, is being used by Ford Motor Co. to predict the performance of steering linkages and other components of its 1973 line of light trucks.

By incorporating Nastran predictions into its design process, Ford's Advanced Analytical Technology Department reported a 60% improvement in predicting the behavior of components under stress and a time-saving of two-thirds in achieving such calculations.

The computer program was also used extensively in the design of a new "activities center transportation people-mover system" to be demonstrated at the Transpo '72 exhibit, planned for this spring at Washington's Dulles International Airport.

More than 40 Ford engineers have already completed indoctrination classes in the use of Nastran, becoming familiar with its possibilities for improving automotive design.

Design engineers predict the computer program will be particularly effective in solving design problems related to the reduction of high-speed vibrations and in facilitating the design of various suspension components.

Nastran, originally developed at a cost of $3 million, and several hundred other computer programs developed for use in the space program are made publicly available to any U.S. user as part of the Nasa Technology Utilization Program for the nominal cost of evaluation, processing and distribution.

Cities, States Not Happy With FBI Rules

(Continued from Page 1)

such systems "shall . . . be dedicated to law enforcement purposes and be under the management control of a law enforcement agency."

The problem with a dedicated system is primarily one of cost, according to Dan McGraw, past president of the National Association of State Information Systems (Nasis), one of the organizations that is challenging the regulations.

The Nasis position is that the states should have the right to decide what functions should be placed on what computers and that it should be up to the states to decide if they can afford to dedicate systems to law enforcement applications, Nasis Staff Director Chuck Rowan said.

Most states do not have enough money to be able to dedicate such systems, he added.

While officials of Nasis and other interested parties said they are as worried over security of the systems as the FBI is, they indicated that adequate security could be maintained in shared systems as well as in dedicated systems.

"We don't need dedicated computers to get the level of security

He said the systems used in law enforcement applications were of necessity large ones and they often required backup systems. They are large because they need to be communications oriented and on-line, he said.

The need for backup is acute with such systems, he added, noting it would be extremely costly for a local government to have a backup computer that could not be used for any other purposes.

The National League of Cities has also criticized the regulation. In a statement issued late last year, the league said: "The exclusive dedication of computer and information processing technology to a single function . . . is not in the best interest of cities or their citizens."

The league also criticized any federal grant programs that would require such a dedication of systems, a reference to the Law Enforcement Assistance Administration which funds many of the police networks around the country.

The critics have a powerful ally in the form of Jerris Leonard, the administrator of LEAA. Noting hundreds of complaints over the regulation, Leonard said: "If we can't allow the joint use of these systems, I don't think LEAA ought to help state and local governments obtain computers."

Leonard also echoed the critics regarding security by claiming that adequate safeguards could be built into the hardware and software of shared systems.

He also said that LEAA would work to get the bill changed before it is enacted by Congress.

The officials also said completely dedicated systems would only be required at locations that stored criminal history information, and said this would probably be only at the state level, not at the city level.

The FBI, barraged by the criticism, is apparently trying to take a more moderate stand on the issue than it has in the past.

FBI officials said the bureau would accept systems that were controlled and dedicated to use by criminal justice agencies, which not only includes law enforcement bodies, but also the courts, prisons, etc.

FBI Waives Regulation

CINCINNATI, Ohio – One county that had a particular problem with the FBI's regulation was Hamilton County, Ohio, which operates its police network to 40 local police agencies including Cincinnati, on a shared system.

Under the FBI regulations only one statewide center in each state was allowed to connect with the NCH files, but the Ohio state system could not communicate with the files because of incompatibility, so Hamilton County couldn't.

In this case the FBI waived the regulation and allowed the Hamilton County system to hook up directly, until the state system is capable of interfacing with the files.

At the same time, the FBI has allowed Hamilton County to access the NCH files, even though it operates a shared system.

According to Andrew Atkinson, director of the Hamilton County Regional Computer Center, the county was able to convince the FBI that it can guarantee the security of the files without dedicated systems.

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County DPers Suspended

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four keypunch operators were dismissed, with the stipulation that they would make restitution to the county for illegal money received, a total of about $1,000. Gardner is alleged to have kept about $1,800 for himself during the two months of operation under investigation, and there was no restitution clause in the agreement to drop the felony charge, McCluskey acknowledged.

Meanwhile the county DP operation is running with half its staff under suspension.

Acting DP director Irving Post had "no idea" when the matter would be resolved, and said the center is running "up to the wire" on many jobs. No deadlines have been missed yet, including payrolls, he added.

The county operates an IBM 360/20 on one and a half shifts, Post reported. He is unable to hire replacements for the suspended employees until the six who have been suspended are either fired or reinstated.

'Not Resigning'

Gardner's attorney said the DP director was "not resigning," but added it was too early to comment on whether any administrative action against Gardner would be appealed. He is "assuming" the county will try to dismiss all six employees, although the county officials "could reinstate them all, if they wanted to."

The "customer," Beaverite, is now obtaining computer services from another local user, and is considering acquiring its own computer or turning to a service bureau in Syracuse, about 100 miles away.

The man who may have to decide the fate of the employees is F. Clark Hamlin, clerk of the board of supervisors. Hamlin was uncertain about administrative actions at press time, but McCluskey said he thought there was a clause in the civil service code which calls for "automatic" dismissal of an employee found guilty of a crime which involves his job.

Gardner's attorney said he was not aware of that clause. Hamlin said it is a "black and white" case with a felony, but not with a misdemeanor.

Gardner has been employed by the county for about 12 years, seven in the computer area, Hamlin added. He said he had "no doubt" this situation exists in other centers. "The problem is, they were caught here," he noted.

News Wrapup

Bell Considers 'Competitive Rates'

NEW YORK – AT&T has served notice that it intends to file a new tariff proposal to compete with MCI on the specialized carrier's first route between Chicago and St. Louis.

"We intend to file competitive rates within the next few weeks," an AT&T spokesman said.

It is known that Bell recently approached FCC staff members to see how such a competitive rate proposal would be received.

There was no indication what Bell meant by the term "competitive rate." But, an AT&T statement said that the recent FCC decision giving approval to the new specialized carriers had included the stipulation that existing carriers would be allowed to "compete fully and fairly."

State Won't Sue on RCA Contract Question

JEFFERSON CITY, Mo. – A multimillion dollar computer contract executed by the state in 1965 with RCA was illegal, according to the state's attorney general, John C. Danforth, because both parties reportedly did not sign it.

But the St. Louis *Globe-Democrat* reported that the governor's office "felt it was not a worthy target" to bring suit because of the chaos that would follow. The newspaper said a recent report from the state auditor shows that RCA did not sign the contract documents until about a year later.

Computer Spots Hyperactive Charge Account

CHICAGO – Too much of a good thing proved the undoing in an alleged charge account fraud when a computer used by a store here noted that the charge account of a local man was unusually active in the last two weeks.

Police arrested two women at the address where the goods were delivered. They had ordered goods in the name of the charge account of a local man, police said, when they read a notice in the newspaper that his daughter had been married. The store put the order through even though one of the defendants said she had misplaced the account number.

California Plans Electronic Pay Deposits

SAN FRANCISCO – California banks hope that by February or March employers can transmit their entire payroll to any bank via magnetic tape. The tape will go through the bank's computers and deposits will be recorded for individuals who happen to be its customers.

The tape then goes to the clearinghouse at the Federal Reserve Bank which will transmit pertinent entries to other banks anywhere in the state. The state system has been worked out by a committee representing 10 major California banks but will serve 144 different banks and their 3,000 branches.

Britisher Urges U.S. Lead Rights Protection

LOS ANGELES – A member of Britain's House of Commons warned that the growing use of computer data banks and wiretapping is becoming an international problem, robbing individuals of their right to privacy.

At a recent press conference, Leslie Huckfield, a member of Britain's Labor Party, called upon the U.S. to lead the way in protecting individuals' rights so other nations may follow its example.

Huckfield said he has presented a bill in the House of Commons to license data bank operators and to give an individual the right to know what information has been stored about him.

The Ghosts Will Never Pay Their Bills

CHICAGO – You just know George B. Slate will never pay his most recent tax bill for a small parcel of land in suburban Harvey. The computer-printed tax bill was mailed to the correct address but the recipient has been dead since 1935.

Several letters to the treasurer's office in the last five years from Slate's relatives have failed to halt the flow of tax bills. Cook County Treasurer Bernard J. Korzan said that Slate may be among "nearly 1,000 ghosts and no names that receive tax bills each year.

"I know it sounds ridiculous, but state law requires that we carry abandoned properties on the tax rolls for 10 years before they can be sold to the highest bidder at a scavenger sale. So we have to go through this stupid thing of mailing out tax bills to nobodies."

It's a Male Chauvinist Talking Machine

STANFORD, Calif. – Better brush up on your most impeccable English diction before you converse with a computer being built at the Stanford Research Institute.

The machine, which would verbally answer certain work problems, would converse with humans as long as they followed the ground rules. They include sticking with 100 words programmed into the computer and avoiding slurs in speech – nobody will address it except in "pure American male English."

Women, explained Bertram Raphael, manager of the artificial intelligence program at SRI, have a different way of speaking and that would complicate the technology involved.

SRI is one of several institutions and firms undertaking the five-year project for the Advanced Research Projects Agency of the Department of Defense. The computer might have a voice built into it but the replies would sound quite weird, in a monotone and without the inflections summoned by the human voice box.

An important message to DP management about a dramatic development for IBM users.

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If you don't spool, GRASP should be considered. It will increase system availability from 15% to 30%, thus reducing overtime of both people and hardware. With GRASP, you can effectively spool on 20 cylinders of 2311 and 4K of core with NO CHANGE to existing programs or procedures. And within 15 minutes of installation.

For the larger DOS user, some outstanding features of GRASP/II.

1. F0:runs in totally independent F0 partition; three batch partitions are available for user processing.
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Mini Controls Inventory

Central Pharmacy Serves 3 Hospitals

Special to Computerworld

ST. PETER, Minn. – Automatic reorder advice, net dispensing financial reports, dormant drug usage reports and maintenance of the hospital formulary are among the outputs of a smooth-running pharmacy inventory control system at a complex of three state hospitals here. Served by a central pharmacy, the three hospitals have a combined patient load of over 800 patients.

The complete system, which includes use of prepunched transaction cards as turnaround documents to order drug items from the pharmacy, is run on a small card I/O minicomputer leased for $610 a month. The mini's primary mission, however, is vocational training, at the Project 500 facility in the Minnesota Security Hospital.

From specifications prepared by William C. Lightburn, administrator, James Littig, business manager, and Hal Wyland, pharmacist, the pharmacy system was designed, programmed, converted, and is operated by patient-programmers at Project 500.

Sixteen nursing stations, and the pharmacy, each have an alphabetical file of prepunched transaction cards representing the 850 drug items stocked at the pharmacy. Nursing station personnel order drugs during the day, for next-morning dispensing, by pulling and filling out the appropriate cards. Each evening the day's cards are replenished by Project 500, then keypunched as input to a computer run which produces a "medication order" report for each station.

The pharmacy dispenses drugs from its copy of the report the next morning, and signs the cards which produced the report to authorize reentry into the weekly update run.

This same card is also used by nursing station personnel for "stat" (emergency) orders which must be filled immediately, and to return drugs to the pharmacy. The card is used to order full containers of medication to replenish medical cabinets at the stations, and to order any number of units of medication for patients on self-medication programs. The same transaction card is also used by pharmacy personnel to record receipts from vendors, returns and any necessary adjustments.

"Our participation in the dispensing activity," said Project 500 manager Van Thompson, 'is strictly to capture all pharmacy activity as promptly and accurately as possible. What we are really after is the management report series, starting with the weekly update run. The system probably has made some improvement in the accuracy with which drugs are ordered; and the dispensing subsystem does provide an excellent audit trail, which is especially important due to the large number of narcotics and other controlled substances dispensed."

The error rate in use of the transaction card by over 200 nursing station employees has been consistently under 1%.

In addition to extensive edits, the one-pass weekly update program includes:

- An activity report showing all transactions and their effects on the inventory.
- Calculation of new on-hand and inventory value balances, and punching of an updated master card.
- ROP calculation and punching of ROP indicator cards used in a second run to produce a complete reorder advice report.
- A net dispensing analysis report, by hospital, of activity in each of 22 drug classifications.

A monthly summary procedure produces a report for each nursing station showing net expenditures in the previous and current months, and change, both for the station as a whole and per patient – in the 22 drug classifications and overall – and shows comparative figures by hospital and for the three hospitals combined.

Student 'Dropout' Says She Really Exists

ALEXANDRIA, Va. – Robin Henry attended classes almost every day last fall at a high school here but was listed as a dropout on computerized school records for more than two months.

When her father asked the school about her report card he said he was told: "So far as we're concerned she doesn't even exist." School officials said Robin was inadvertently listed as a "no-show" shortly after school started and her name was erased from a computer's master list of students.

The officials could not explain why records of the girl's daily attendance and grades were never compared with the master list or caught by the computer when it received reports on someone it had been told was a nonexistent student.

"I hear about problems with computers," the girl's father, the Rev. Arthur R. Preston said, "but they just do what they are told to do."

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Disclosure of Consumer Complaint List Object of Group's Suit Against FTC

NEW YORK – A local consumer organization has filed suit to force the Federal Trade Commission to make public a list of consumer complaints and the companies against which the complaints were made.

The computer-generated list is the combined complaint file of 21 local, state and federal agencies that last summer formed the Consumer Protection Coordinating Committee. It is printed by the FTC and distributed to member agencies for internal use. The suit, which cites the 1966 Freedom of Information Act, was filed on behalf of the Consumer Assembly, a federation of 110 labor and consumer groups.

It contends the public has the right to know which companies generate substantial numbers of complaints.

Richard A. Givens, FTC regional director, said he thought disclosure could endanger the whole program. He was alleged to have acknowledged that it would put pressure on companies that produce large numbers of complaints but added that it would be unfair because it would not indicate if the complaints were justified. The assembly said it would settle for the list with any complaints not yet investigated deleted, but Givens pointed out that unscrupulous companies could flood agencies with unfounded complaints against competitors to damage their reputations.

Action on the suit is still pending.

Oakland Readies Computerized Postal Service

OAKLAND, Calif. – What is described as the nation's first computerized postal traffic system is being installed here to keep track of incoming and outgoing mail.

Officials believe the system, modeled after one used by most of the nation's railroads to supervise their cars, will save the Postal Service money in about four years.

The computer will gather information from circuits in Sacramento, San Jose, San Francisco and Los Angeles and predict how much mail will arrive at the main post office, when it will get there, what sort of mail it is, and where it's headed.

Costing just under $890,000 the system will allow local managers to schedule the work force efficiently and also keep track of mail vehicle traffic in and around the main Post Office.

The system is expected to be fully operational by Jan. 15.

Compatibility Aids Accounting

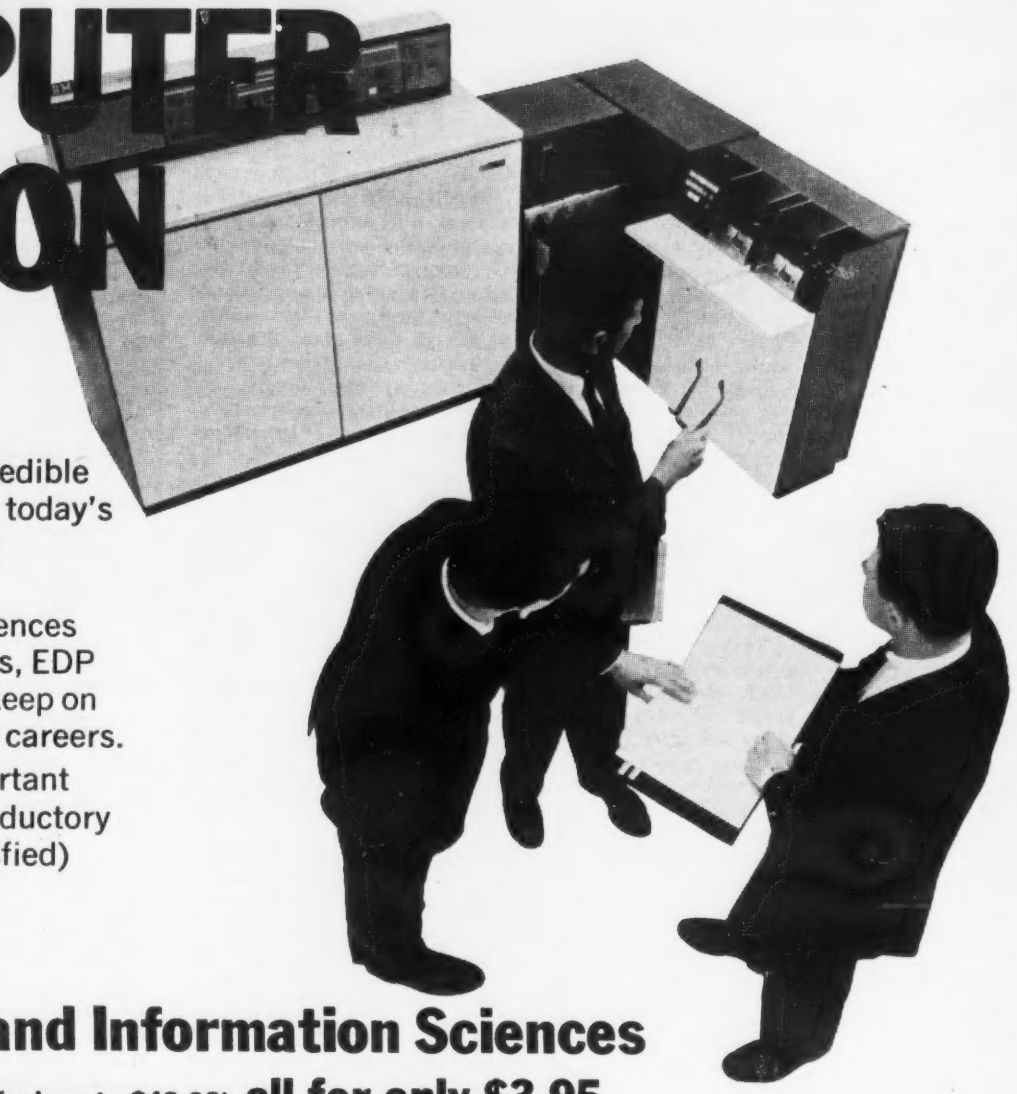
HYATTSVILLE, Md. – The Department of Agriculture's Consumer Marketing Service has put into service one of the most modern automated accounting systems in the Federal Government, through a compatibility package developed by the Univac Division of Sperry Rand Corp.

A special data communications subsystem (DCS-1C) was built into a standard 9300 and special software was developed by Univac, enabling the C&MS facility here to transmit data from magnetic tape and receive data from the central site 360 in downtown Washington.

C&MS will have approximately two million source documents each year keyed directly to magnetic tape which is loaded on either of two Uniservo VI-C tape drives and transmitted to the central site.

Financial activities, such as accrual accounting, obligation accounting and planning, programming and budgeting, formerly accomplished at various C&MS offices throughout the U.S., are now consolidated at the facility here.

THE COMPUTER REVOLUTION



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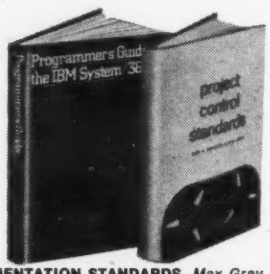

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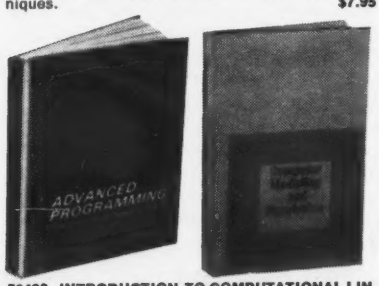

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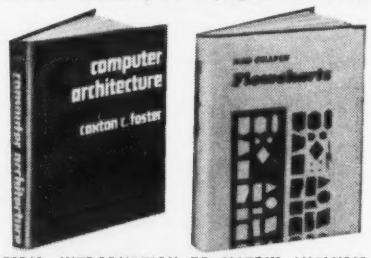

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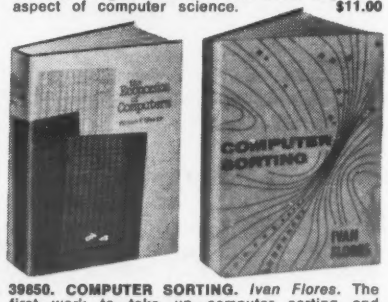

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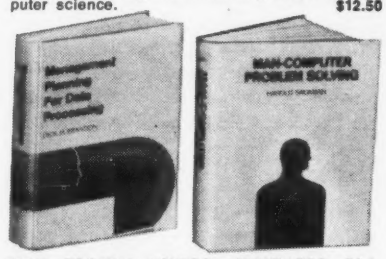

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Special Report: Communications, Part I

Fact or Promise? New Carriers Affect All Users

By Ronald A. Frank
Of the CW Staff

It is generally agreed that the new specialized common carriers have drastically altered the type of communications that will be available to data users in the future.

But while the new carriers have been received with open arms by data users, many are still unclear about the exact impact that such companies as Microwave Communications Inc. (MCI) and Data Transmission Co. (Datran) will have on their operations.

It is true the new carriers will compete with AT&T (which in itself sets important precedents), but the established dial-up phone network that offers Plain Old Telephone Service (Pots) will be only indirectly affected.

The major impact of new services will be felt by users who today are private line telephone subscribers. And even if these users sign up with a specialized carrier, they will continue to need modems.

The specialized carrier concept was born in 1963 when a small company called Microwave Communications Inc. filed an unusual tariff request with the Federal Communications Commission. The firm proposed a microwave system between St. Louis and Chicago that would lease circuits to large business users.

Among the more innovative service proposals were part-time usage, with lower than full-time rates; one-way service (Bell supplied only duplex or two-way service); and shared usage that would allow more than one user to subscribe to the same channel.

Actually the first breach in Bell's monopolistic hold on users came in 1959 when the FCC said large companies such as railroads and oil pipeline firms could construct data networks over their rights-of-way as long as such nets were used for their own internal messages. This was called the "Above 890" decision.

The MCI filing expanded on the private network concept by proposing to lease facilities to subscribers. The precedent set with the MCI plan was *not* direct competition with Bell, although this would be one effect; it was *not* an attempt to provide lower cost service than Bell, also a real possibility; it *was* a plan to provide to users specialized services not available from Bell or any other existing carrier.

The reaction of the existing carriers to MCI's 1963 proposal was swift and vigorous. AT&T, Western Union, and General Telephone strongly opposed the would-be carrier, alleging that the planned system would cause harmful interference to existing microwave systems, deprive the public of the benefits of economies of scale, disrupt the practice of pricing private line services uniformly across the country (known as average cost pricing), and would provide unreliable service.

'David and Goliath'

The extensive objections of the existing carriers and the precedents inherent in the MCI application set off a series of regulatory proceedings that were to last for seven years.

Although some of the points discussed before the FCC concerned important economic and technical questions related to MCI's ability to provide service, the proceedings before the commission had all the aspects of a David and Goliath drama.

In describing the MCI proposal, Bernard Strassburg, chief of the FCC's Common Carrier Bureau said: "The MCI application was really the first clear-cut opportunity for the commission to decide whether or not to allow a new entrant in the long-haul [communications] field providing services somewhat akin to those provided by the existing carriers.

"MCI was the first applicant that stuck with its application long enough and fought it stubbornly enough to bring it to a point where the commission had to make a decision."

An indication of public sentiment concerning the need for the new carriers came in October 1970, when more than 100 organizations responded to Docket 18920 to support the establishment of the new carriers.

Since the public usually does not respond to regulatory requests for opinions, an FCC official called the amount of letters and position papers received an "unprecedented response." The responses would certainly be a factor in helping the commission decide on the need for the new carriers, he said.

In June 1971, the FCC ruled unanimously that entry of the specialized carriers was in the public interest. It added that despite the protests of the existing carriers, the new applicants would not have an adverse impact on existing services.

As part of the ruling, the commission said the existing carriers would be permitted to compete fully and fairly with the new carriers.

Flexibility of Service

More than any other feature the MCI flexibility of service carries important implications for users. It has always been Bell's principle to "rent" a line to a user and then to let him decide how to best use the line.

Of course Bell's "data consultants" recommend the best types of services, but the traffic patterns of the user have

(Continued on Page 11)

Carriers Vie for User's Approval

The new specialized common carriers may eventually revolutionize communications, but their effect on most users will be gradual.

Except for a few users, specialized carrier services are not yet within reach. And even when the national specialized carrier networks are completed, they will appeal most to one type of data user. But with the FCC's green light to compete, AT&T can be expected to react in ways that will be important to all users. And as the new carriers consolidate their positions, their services may be based on emerging technologies such as satellites and cable networks.

Despite the many optimistic predictions, users will not be immediately affected by the new services. Data networks take careful planning before they are set in operation. This month's special report gives users an overview of what is available, what can be expected, and the trade-offs associated with new data services.

Cable Networks Could Solve Local Loop Problems

By a CW Staff Writer

One solution to the local loop problem has great potential for data users. Local loops are the connecting lines that run from the user's premises to the specialized common carrier's nearest terminal.

The specialized carriers presently plan to use local telephone company wire pairs to get their service into subscriber's installations. But this method adds to the total package cost, so most carriers are also planning their own local distribution systems.

Some proposals include short distance microwave, links to stationary satellites "parked" in orbit over the U.S., and optical transmissions such as those being tested by Datran in the infra-red range.

But the answer may lie in the cables that many predict will be installed in cities. Up to now the cable TV nets have been supplying so-called "distant signals" to isolated areas which have difficulty receiving over-the-air TV broadcasts.

But these Community Antenna Television (CATV) operators are anxiously eyeing the cities as a fast way to bring their cable services within reach of many thousands of additional potential subscribers.

A few examples of new services that could be provided to wired city cable users are already available.

Some sections of New York City have CATV systems that provide weather and stock report services. While these are still non-digital, the excess capacity of the cable nets clearly is pointing toward the needs of data users, according to many observers.

Before wired city systems can become a reality, the FCC and local city governing bodies will have to rule on who will get the lucrative franchises. Additionally, the FCC is wrestling with the correct method to regulate cable TV.

Foremost in a long list of CATV proposals, the FCC has said all new cable systems should have two-way signal carrying capabilities. The implications of such systems are staggering for data users.

Transmission Tests

There have already been several tests to verify the potential data capabilities of CATV. In Portsmouth, N.H., last summer, Ascii data signals were transmitted by an "intelligent terminal" at a 1 Mbit data rate over a two-mile cable TV link. The results were much more reliable than existing Bell local loops, according to a spokesman at Sanders Data Systems, the firm that ran the experiment.

Other tests are being conducted around the country. A test in Reston, Va., by the Mitre Corp. has shown it is feasible to display data on the screen of a home TV

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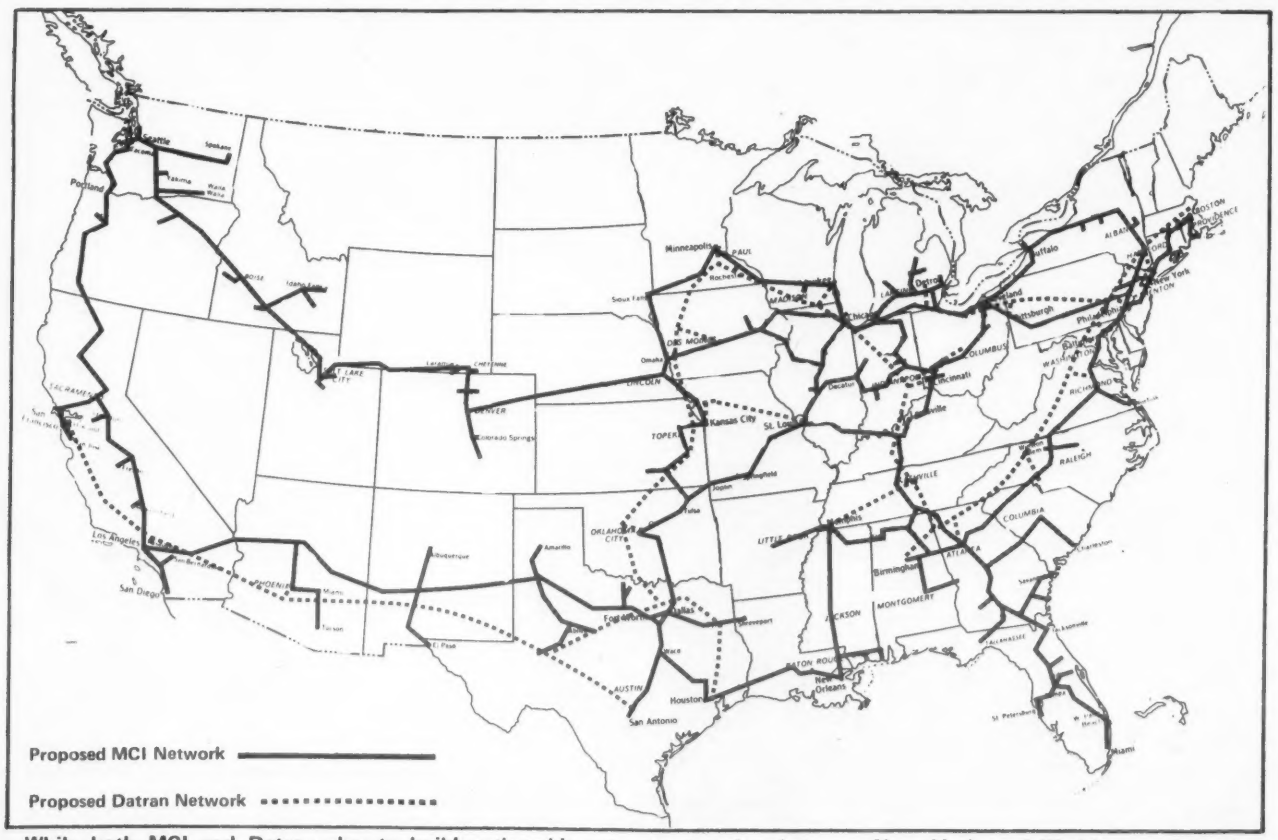


While both MCI and Datran plan to build nationwide networks, actual coast-to-coast operation is still several years away. MCI, with one link in service, and a second ready for construction between New York and Washington, D.C., is considered to have the edge over the other specialized carrier applicants.

New Carriers Increase Service Flexibility for Users

(continued from Page 10)

always had to fit into the pre-cast AT&T mold.

Now the new carrier is offering the user the turnkey service approach to communications. As an example of its "customized" image, MCI supplied both the modem and multiplexer for its first user, Trans Union Systems Corp. in Chicago.

If the Trans Union modem (a 4,800 bit/sec Milgo unit) should fail, the carrier, not the supplier, will repair or replace it as required.

Trans Union will pay MCI $580/mo, which includes the cost of the modem and multiplexer. Before, the company paid Bell $1,504 for two channels with modems.

With the new service the user gets 10 TTY channels plus a 2,400 bit/sec channel through use of the multiplexer. Ironically, Bell does not supply multiplexers so that portion of the service cannot be duplicated by the phone company at any cost.

The net effect for Trans Union to switch to MCI will be 10 times the line capacity at 40% lower monthly costs.

For Trans Union it means a complete communications package. While users of Bell data sets have to contend with separate line charges and equipment rentals each month, the MCI user gets only one bill.

Additionally, when MCI improves service, it will make changes without modifying its basic price. If MCI were able to eliminate the present Bell local loop, for example, it might provide Trans Union with a short range microwave system. While such modifications would not be done without the user's okay, it emphasizes the potential advantages of the specialized carrier services.

And even if AT&T decides to offer similar flexibility in its service offerings, such head-on competition should help the data user in the long run.

It is still difficult to predict how soon users can rely on a nationwide specialized carrier service to major U.S. cities. With MCI in service between Chicago and St. Louis, and its second link approved between New York and Washington, D.C., the new carrier seems to have the edge.

Construction on the East Coast leg will probably begin in the spring with possible service late in 1972. If the FCC next gives early approval to MCI New York West, from New York to Chicago, the company could have a network spanning from the nation's capital to St. Louis in operation by early 1973.

In terms of equipment operation, the flexibility of MCI's different bandwidths are important to the user. The new carrier plans 50 separate channel bandwidth offerings between 200 Hz and 960,000 Hz. Bell offers three within the same range. In effect the user will be able to lease exactly the bandwidth required for specific data devices.

As an example, Continental Can Corp. plans to use facsimile units for direct input of data into a CPU. It will experiment with a 2 kHz line to transmit this data. The narrowest bandwidth available from Bell is the voice-grade or 3 kHz channel.

Tailored bandwidths mean lower rates for the user because he is paying only for what he needs. On a more pragmatic note, more users will be able to utilize the already crowded frequency spectrum because hopefully no specialized carrier subscriber will be paying at a 24 hour rate on a channel that is being used only 10 or 12 hours per day.

Although it is still premature to make detailed rate studies between Bell and the new carrier offerings, some comparisons can be made. MCI will charge about $1/mo for each mile of voice-grade channel leased to a user between Chicago and St. Louis.

Although the firm does not yet have a "long haul" tariff, the rate will be about 80 cent/mo for each mile of voice-grade line.

In comparison, a Bell 3002 series line which is covered under AT&T's interstate tariff 260 is based on a sliding mileage scale. But a few examples will illustrate the potential savings that are involved.

For half duplex service Bell lines cost $3/mo for the first 25 miles, $2.10/mo for the next 75 miles, $1.50/mo for the next 150 miles, $1.05/mo for the next 250 miles, and 75 cent/mo for each additional mile. Full duplex service adds about 10% to the Bell rates.

Additional savings are possible for the MCI user who signs up for half-time service (usually a 12-hour slot), for one-way service, and other available "customized" choices. One-way service will probably be priced at 50% of the two-way rate, according to MCI's present plans.

The half-time day rate will be 25% less than the full time rate, and the half-time night rate will be 35% less.

How Will Bell React?

When the FCC ruled in favor of the specialized common carriers, many new applicants filed to stake out their territories in the communications sweepstakes before the FCC. Some of these applicants are already operating microwave systems, and are more qualified than others.

But the big question is still AT&T's reaction to its new competitors. Next week CW will look at the track record of some of the new carrier applicants and speculate on how AT&T will react.

Tests Show Potential Digital Uses of Cable TV Networks

(continued from Page 10)

receiver under control of a CPU.

In that experiment, an IBM 360/50 assembled "TV frames" in digitized form on a disk. On command from the processor, the data was transmitted via cable TV to a normal TV set in a Reston home.

Although the CATV system was one way, with the home-to-CPU link provided by a Bell Touch-Tone phone, the computer interaction showed great potential.

Miniature Wired City

At Mitre's Bedford, Mass., facilities an in-house cable TV system has been constructed to test the data carrying capacity of such a network. Using standard CATV cable, Mitre engineers have constructed a miniature wired city.

Already data has been transmitted at TTY speeds with good results. Eventually the cable link will be tested with CPU-to-CPU transmissions, a Mitre spokesman said.

One northeastern electronics firm has a special staff assigned to developing the potential tie-in of CATV with digital and other services. This group has submitted extensive reports that detail how the wired city concept would serve millions of residential and business users.

Anticipating the availability of cables to all sectors of large cities, this group has spelled out the type of cable communications that could be provided to computer data users. Among these are local distribution for specialized carriers, local distribution for satellite systems, point-to-point intracity data transmissions, and local store-and-forward message nets.

Some services that could be provided in the wired city are user-accessible reference data banks, time-shared computing, batch computer processing, and on-line facilities management.

In addition to the actual transmission tests, several two-way cable systems have been described by the group. In most cases the group sees a two-way capability evolving from limited changes to current CATV systems. Rather than making an individual channel operate in two directions, these plans see separate channels for input and output at the user's premises.

Present cable nets can carry about 30 channels, according to conservative estimates. The cable is shielded and well protected against the type of outside interference often encountered in telephone facilities.

With the installation of normal CATV amplifiers every half-mile, data in digital format can be transmitted up to 15 miles without any undue effect on concurrent TV transmissions.

The data rates at 1 Mbit/sec have been successfully demonstrated. By contrast a teletypewriter transmits about 300 bit/sec using normal telephone lines.

Data would be transmitted in "blocks" similar to Ascii or other codes now in use.

Any number of an estimated 30,000 interactive subscribers could access a central computer. The terminals used could be as simple as an ordinary Touch-Tone phone or as complicated as a full-scale intelligent terminal. For simpler read-out ordinary TV sets could easily be converted to display alphanumerics.

$30 Million to Wire Chicago

The cost to build a wired city system in the city of Chicago has been estimated at $30 million. And the digital uses would be only a portion of the total cable capability.

As envisioned by the planners, initial CATV television broadcast users could generate the revenues needed to expand gradually into digital and consumer oriented services. In addition, educational connections to local schools seem to have good potential.

As part of its Reston experiments, Mitre has developed the Time-Shared Interactive Computer Controlled Information Television (Ticcit), which can send display-formatted information to 100 simultaneous interactive users on a single TV channel.

The Ticcit CPU adds an address to each single field TV picture and injects it into the cable as a regular TV field in 1/60 of a second, allowing transmittal of 60 individual diplays to individual terminals each second.

Technology's Here But

For large and small data users, the technology to access computer data bases for business, study, or pleasure from relatively simply terminals in the home or office is here now.

Why isn't it being implemented? Probably because of the regulatory red tape usually associated with new communications services. Regulatory experts point to the seven-year fight waged by MCI to get FCC approval in the face of Bell-led opposition and say Bell would fight any plan for CATV nets to provide local loops to data users from the specialized carriers.

Some impartial observers are calling for direct government control to forestall long, drawn out regulatory hearings. Dr. Harold Sackman, director of the computer science department at Kansas State University, sees a need for government subsidies to bring the "information utility" to all without catering to the interests of the common carriers or commercial vendors that want a piece of the data pie.

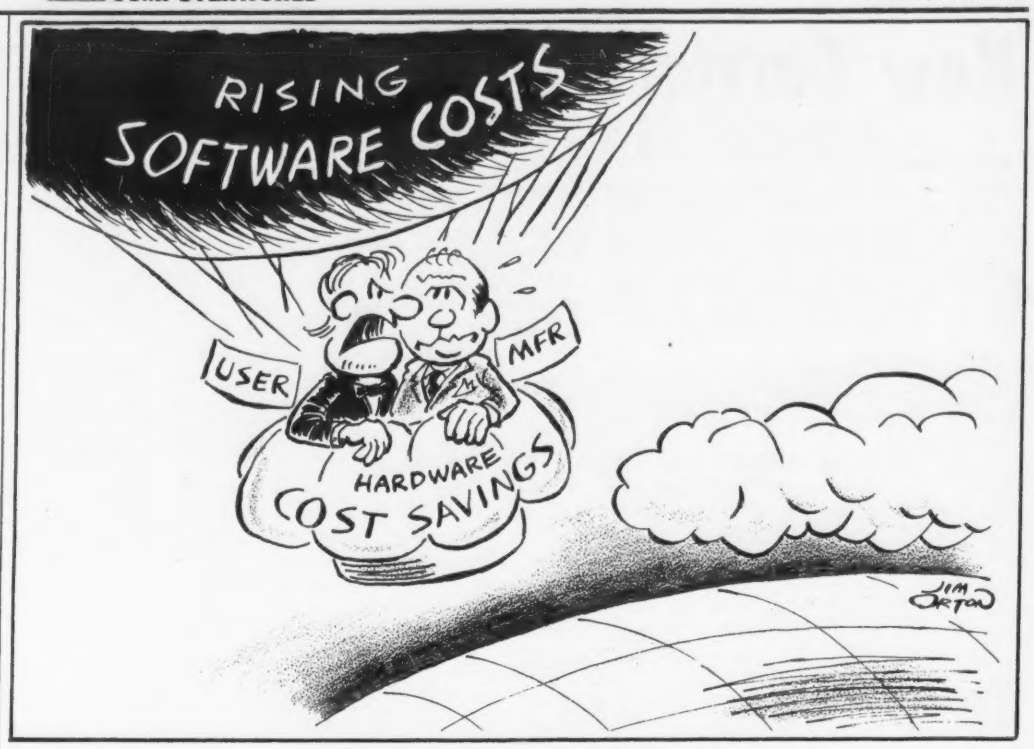
Editorial

Watchdog Needed

Eighty-four percent of U.S. adults think the government should be concerned about regulating the use of computers and 57% think the government will determine what computers can or cannot be used for, according to the Afips-*Time* survey. From what we've seen so far, government concern seems to be a very spotty affair. If this situation is allowed to continue, pressure for government action may build up to the point where some single computer-related scandal will result in an outpouring of restrictive legislation.

What is needed is a permanent government watchdog committee to continuously monitor the situation and to recommend, as needed, the minimum amount of legislation required to protect the public interest.

This month the U.S. House of Representatives is expected to vote on creating a Select Committee on Privacy, Human Values and Democratic Institutions. We urge the House members to establish this committee so that computer use can be "watchdogged" now rather than "hounded" later.



'How About Some More Ballast?'

Letters to the Editor

Overlaying Computer Count With Actual Adds to Sins

"Bless you my son, go and sin no more." If Richard T. Lilly had finished the statement [CW, Dec. 5], that is what he would have written and perhaps he would have eradicated the sin instead of committing another to cover the sin for which he claims absolution.

That sin is: Overlaying the computer count with an actual count. Why is this a sin you ask? Simply this: Whenever you overlay the computer count with an actual count you have put the inventory system back into a manual system and are just wasting time and money running the information through the computer department.

Now you are wondering what the fix should have been; and here it is with justifiable reasons.

Since the lag in time between the transaction and the recording of the transaction will usually cause an apparent difference in actual count and machine count, both counts must be carried. How else can you determine whether the system is reliable?

Date of last transaction and date of actual count need to be recorded to keep a check on whether a human error is involved or a system error has been detected. This will eliminate the need for an adjustment filter, which only made matters worse.

Objection is also raised to the following reasons for a rejected transaction:

- Unit measure incorrect.
- Quantity not within limits.

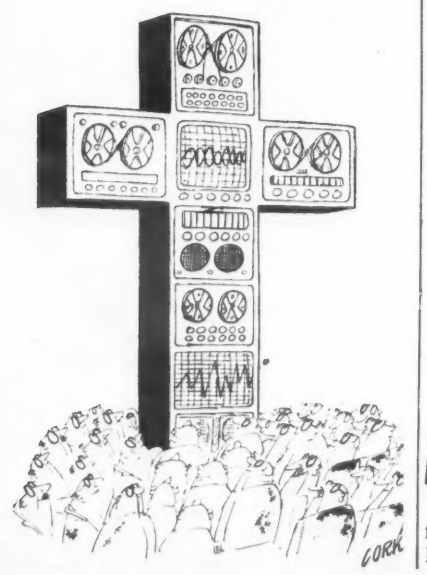
The master record contains the unit of measure for the item and if there is any question about how an item is carried, e.g., feet steel rod or pounds of steel, knowing the volume, it is so easy to convert going either way.

The quantity is controlled by needs, and should never be in the program.

With these minor details ironed out, we now are able to start building a usable system.

James G. Lewellen

Bedford, Ohio



Hardware and Software Does Not a Man Make

The Rev. Arthur Gibson's opinion that some computers possess intelligence and awareness indicates that his lack of expert standing starts not with data processing, but with religion.

I had heard that God was dead – but now we're informed that Man is also. If, Father Gibson believes that "man is a machine programmed genetically," then I suggest that he really doesn't understand the very basis of religious philosophy – that mere quantity of data is not sufficient to "trigger a self-awareness."

It takes a spiritual being to be aware of being aware, and a being is not just an accumulation of hardware and software (regardless of size). And a being is not created by matter – if anything, it's the other way around!

I'm afraid the article contributes nothing to our understanding of computers. But it is interesting as a journalistic curiosity: here's news that rightly belongs in a religious publication under the heading, "Priest Fails to Recognize Spirit, Sees Only Programmed Matter."

Michael Wadler
Assistant Data Systems Analyst
Systems Divisions
County of Los Angeles
Office of Assessor
Los Angeles, Calif.

Beware the Overzealous Employment Recruiter!

The injustice of "Beware the 'Counterfeit' DP Executive: Recruiter" [CW, Dec. 8] and its total incompleteness is quite rattling. It in no way presented a clear way to apply the indictment to determine its applicability to local DP management by the manager and is a slander against all those who are competent.

I wonder how many versions of this article have been propagated where the only changes were substitutions of medical profession/doctor, legal profession/lawyer, recruitment business/recruiter, engineering profession/engineers, etc.

If it were not such a time consuming task in the courts and elsewhere, K. Einstein should be brought to an accounting. Too often the consequences of ill thought out charges, or incompleteness in presentation, or oversimplification lead to secondary effects upon the innocent or the many who are competent.

Left unmentioned, yet implied in the headline, is the specter of the overzealous recruiter attempting to elevate anyone seeking employment in hopes of increasing his percentage of starting salary fee. Put that one in your pipe and draw on it awhile.

Berkeley McKennon
Data Center Manager

Singer Co.
Binghamton, N.Y.

Building Your Own Machine?

I would like to invite Mark James [CW, Dec. 15] and any other readers interested in building their own computers to join the Amateur Computer Society. Membership and a subscription to the newsletter costs $3.

Topics covered in the newsletter cover leads on where to obtain cheap parts and used equipment and reports on construction progress by the various members. Information is available from Stephen B. Gray, Amateur Computer Society, 260 Noroton Ave., Darien, Conn. 06820.

Stephen A. Wiebking

Fairborn, Ohio

IBM Gets the Lion's Share

Please add my name to the roster of computer users with H. Richard Haley and John R. Thomas who recognize the debt the data processing community owes to IBM.

It seems to me that when IBM has the same problems endured in any other company, a vocal minority rises up to blow these out of proportion to the effect they have on the majority of users.

In 15 years of doing business with IBM, I can cite very few experiences which resulted in dissatisfaction or disappointment with the results.

Seymour Greif
Director of EDP

Lafayette Radio Electronics Corp.
Syosset, L.I.

'OEM' Inconsistency Hit

In a Dec. 15 letter James Bradley took Gerald McKernan to task for having a CDP and not knowing the definition of OEM.

When I read McKernan's letter, I thought that here was a man who was not afraid to ask for specific information about a subject he is supposed to be an authority on.

The definition of OEM is obviously somewhat in question because of the differing definitions given by your publication and Melvin E. Conway in another Dec. 15 letter. Perhaps this inconsistency is the reason McKernan was looking to your publication for a clarification of the definition.

I think Bradley is a very small man for his putdown of McKernan's attempt to inform himself. Just because he has a CDP does not make a man a walking encyclopedia of data processing terms.

M.D. Byrne
Programmer

Sonoma County Data Processing Center
Santa Rosa, Calif.

'Take My Word for It'

In the Dec. 4 issue, *Computerworld* listed speakers at the International Business Forms Industries Fourth Annual International Forum. In so doing, it listed John Albert Beiser as president of the Cullinane Corp.

I am pleased to note that Albert Beiser is gainfully employed as president of General Computer Systems and I presume happily so.

John. J. Cullinane
President

Cullinane Corp.
Boston, Mass.

Computerworld welcomes comments from its readers. Preference will be given to letters of 150 words or less. *Computerworld* reserves the right to edit letters for purposes of clarity and brevity. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

How Much Compatibility Do Tape Users Really Need?

The Taylor Report
By
Alan Taylor, CDP

Magnetic tape systems and their use are now coming under scrutiny from many places. One of them hopefully will be the Boulder Valley Tape Users Center, but for the present it is useful to consider other areas that have been studying tape problems.

The main involvement currently lies in the tape reel and tape drive manufacturers' research authorities. Late last year I visited a number of these manufacturers across the country, and have since been thinking about cases where I saw equipment not limited to being carbon copies of the IBM de facto standards.

In Ampex Corp., for instance, I saw an extremely interesting tape controller (you may have seen it at the Fall Joint). The controller has a reloadable memory.

Tape control memories have been standard for some period now, but reloadable memories are still so new that even the latest IBM system does not have them, although other independents do. In Ampex the method of loading is from an Ampex tape cartridge and the memory can be loaded in as many ways as you care to have tape cartridges around.

Now that is interesting. The loading method means that the way the tape reads, tape writes and the other tape instructions are executed can be varied. Naturally there are still limitations involved, because of the presence or absence of particular pieces of hardware in the tape drives concerned, but it makes the whole tape system a lot more flexible.

This means, for instance, that the tapes being produced at 10 a.m. could be totally compatible with the standard IBM tapes, while the tapes produced on exactly the same equipment at 10:05 a.m. need not be compatible! They could be organized in some method which would give the user more output, or more reliable tapes.

Functional Compatibility

This is an interesting concept, because it raises the question as to just how much compatibility users really need. Should everything in competitive tape systems be left identical to a set of IBM specifications? Is compatibility only needed to perform particular functional purposes, such as providing for back-up in emergency, forwarding tape reels from one installation to another, etc?

With non-reloadable tape controls there was only one way of doing things, and if anything had to be compatible then everything had to be compatible. Therefore any compatibility requirement forced the user to accept a full compatibility straightjacket.

This situation still exists so far as the current IBM design tape controllers are concerned, but not if, like Ampex or STC, the user adopts the method of a reloadable controller.

Head Wear Down

Across the country, on Long Island, I found another interesting development in the Potter Instrument Co. laboratories. This was not actually in the tape controller, but in the tape drive itself. It consisted of a tape head which had been covered across most of the non-sensing areas with a special hard coating. The advantage of this coating was that head wear was drastically reduced.

In fact, the way that Henry P. Kilroy, vice-president, engineering, described it to me was that it made head wear a problem of the past!

Soft Tapes Were Favored

This also could be important. Soft tapes have in the past been favored by tape drive manufacturers because of the lack of head wear. But these tapes are basically comparatively dirty, and therefore have to be cleaned more often than necessary.

Some tests of IBM tapes, compared with 3M and Memorex tapes, have shown more dirt being accumulated on the capstans during the same exercising, so that additional cleaning that IBM advises appears to be really necessary.

But if the Potter hard-coating really does reduce the head wear, and so reduce the financial exposure of the drive manufacturer, then we will be able to use the current independent tape manufacturers' standard tapes, gain from their comparative cleanliness, and perhaps be able to then increase the productivity of the current tape systems themselves!

Productivity Gains

This idea of increasing the standard of tape systems with better tape reels may sound ludicrous, but it is real. The current standards had to be chosen with knowledge of the actual use that tape drives get and by considering the worst type of tape to be handled.

If the user is prepared to provide better tapes, and the heads can be protected, then it will be possible to improve the expectations and to run the tapes more productively.

> *"Do users really need to insist on that '100% compatibility' which they so often demand?"*

And so, Kilroy's statement that head wear could be a thing of the past implies that the performance of the hardware can be improved if the user wants it to be improved.

Monolithic Compatibility

Putting these two non-standard items together – the Ampex reloadable memory and the Potter Tape Head plastic – we find that although the need for compatibility for some user applications continues this no longer necessarily means that only compatibility is to be allowed.

The true equation then is that total compatibility is costing the user performance! Under these circumstances do users really need to insist on that "100% compatibility" which they so often demand?

I hope that this is one of the problems that the Boulder Valley Tape Users Center will consider. I would like to hear from the group as to just how much compatibility it believes a user really needs – and I would like to hear from other readers as well.

IBM Shuns Parity Checking Criticism

Taylor Thoughts

The column, "Are You Sure Your Data Is Being Parity Checked?" [CW, Nov. 24], pointed out that IBM Phase Encoded (PE) tapes used a "dead-track" system during reading. In dead-tracking only eight of the nine physical tracks are used to produce the eight data bits that make up a byte, so that parity checking of the byte – which requires a ninth bit – is impossible. Data is then read into the system without being parity checked.

The November column stated that this was a scandalous situation.

Apparently IBM felt that its customers and its own employees would be surprised by the idea that unchecked data was being forwarded as correct. The director of I/O Systems Marketing, G.P. Fusco, sent out a special memo to all branch managers to explain to IBMers and customers that IBM systems were reliable.

Unfortunately for anyone wanting reassurance on this point, the director never mentioned whether or not any of the PE tape data was in fact being supplied to the processor without passing the standard parity checks – which was and is the major criticism. Nor did he consider the possibility of a second parity error, involving one of the other tracks occurring while the parity checking circuitry was being ignored on his systems.

So a user of IBM's PE tapes was left in the dark about the existence of the criticized area, or the possibilities of undetected errors because of the dropping of parity checking.

Non-Dead-Tracking Attacked

Fusco did have time and space to consider what would happen if dead-tracking were not used, although this really only concerns prospects IBM salesmen are trying to sell, rather than users of IBM equipment stuck with the dead-tracking method.

Because of tests that he said IBM had conducted Fusco concluded: "Non-dead-tracking can introduce new errors caused by mis-synchronization. These errors can go undetected."

Factually, however, all that such tests could have indicated was that the particular IBM-designed equipment was faulty, but that in no way impugns other designs, or other equipment which happens also to avoid dead-tracking.

A moment's reflection will see that the claim itself is untrue, assuming that it means that failure to use dead-tracking will lead to errors, which dead-tracking would have detected, passing into the computer.

The obvious non-dead-tracking error detection system simply acknowledges that a transmission error has occurred when the first parity error is noted – and starts reread operations then! Under this system no additional undetected errors would be read into the computer because of the lack of dead-tracking.

Attack on Methods

So what we have here is an attack on the methods used by successful competitors (Honeywell, Ampex and STC among them) based on irrelevant tests and pressing a false conclusion.

This incident appears to indicate that our monolithic compatibility syndrome may well be controlling our reliability standards – as well as our productivity ones (See The Taylor Report).

Developing Nations—Part II

DP Use Hindered by Copyright, Employment Problems

By E. Drake Lundell Jr.
Of the CW Staff

NEW YORK – In addition to the fear of computer systems, also prevalent in highly industrialized nations, there are several other factors that may inhibit the use of computers in developing nations.

The two most important possible inhibitors involve the effect on the local employment picture and the problem of copyrights, patents and customs barriers, according to a recent United Nations study on the possible uses of computers to aid developing nations.

"It is evident that technological change affects employment" and "the possible effects of computers and computer capability . . . on real or imagined employment opportunities is a matter worthy of serious consideration," the report states.

At present "there is little evidence available about the true effect of computers on employment in the industrialized nations, and even less for developing countries," the U.N. report says.

"Most of the accumulated evidence relates to the effects of computers on office employment," but computers are beginning to affect occupations other than those of office workers, insurance clerks and middle management," the study warns.

At the same time, the report notes that the introduction of computers in industrialized nations creates a wide variety of new jobs for which people could be trained while they were being displaced from previous occupations.

"These conditions," the report states, however, "very probably do not apply to the developing countries, because of the differences in educational opportunities, mobility, job security and other socio-economic factors affecting the labor force in many developing nations.

"Whereas high unemployment in developed countries is a possible threat which sometimes materializes, in developing countries where much of the labor force is in agriculture and process industries, both highly susceptible to automation, it is usually a chronic situation.

"Reducing labor costs, which might, in part, be a reason for installing automatic equipment in an industrialized country, is a disadvantage in a developing country where every change that results in a loss of jobs must be well justified," the report states.

Because of this possible loss of jobs, "industries and governments must be prepared . . . to use all measures which have been developed to cope with job dislocations resulting from technological change,"such as the introduction of computers, the study continues.

This is the second part of a survey on the role that computers can play in aiding developing nations, and the U.N.'s plans for speeding their application.

The report notes that copyright and patent laws will increasingly govern the exchange of software and states that licenses to use programs could place strains on the foreign currency positions of some developing countries.

Therefore, it is "necessary to consider ways to keep developing countries from being injured by restrictions of access to these important components of the computer technology," the report states.

Among the ways to be considered, the report suggests that special terms (including possible complete waiver of patent and copyright fees) could be offered to users in developing countries.

Aid Programs

In addition, possible special aid programs could be established to help developing nations pay the royalty fees on patented software, or developing nations could offer tax incentives to firms which would offer software free or at reduced cost.

The problem of customs duties on computer equipment and programs could also inhibit the use of computer equipment in the developing countries, the report states.

"There is a need for a cooperatively developed uniform policy of customs treatment for all types of programs and data and the United Nations should encourage Unesco and other international organizations concerned with this problem to develop such a policy."

Blindness No Deterrent to Young Female Programmer

LONDON, Ont. – Ruth Tolton is not easily deterred. Two years ago, just 22 and at the start of a promising career with a major trust company here she suddenly became blind, a complication of the diabetes she had suffered since childhood.

Her work in statistics had brought her into frequent contact with the company's computer operation. Just prior to her blindness, she had decided to make her career in the computer field.

"When it happened I was completely crushed," she said. "It seemed to me that a computer programmer depended heavily on his eyes to construct flowcharts and write and debug his programs. It was inconceivable to me at that time that these jobs could be done by a blind person."

Miss Tolton went through a demanding adjustment period in Toronto at the A.V. Weir Centre, the national training center of The Canadian National Institute for the Blind (CNIB).

While at the Weir Centre, Miss Tolton heard of a course for blind computer programmers offered by the University of Manitoba. Her application for enrollment in the course was accepted. First she had to complete a pre-university training session at the Weir Centre to learn, for example, how to operate a tape recorder to record lectures, and other skills to help smooth her transition into college life as a blind student.

At the university she learned how to write a computer program in Braille on cards, one statement per card. If, in the course of developing a program she wants to make changes, she simply removes the cards concerned and replaces them with new cards with the revised statements.

When a program is complete, she types it, using an ordinary typewriter, or dictates it for a keypunch operator, who transcribes the program to punched cards for use by the computer.

On the first trial run the computer will indicate on a printout any mistakes in logic or format. A sighted person reads these "diagnostics" to Miss Tolton who then makes the necessary corrections in her Braille cards.

"The entire process only takes a few minutes longer than if a sighted programmer were doing the whole job," she said.

Upon graduation from the university she was hired by the CNIB in Toronto to program the Honeywell Model 58 computer which the Institute is installing early next year. Honeywell has helped by offering her training on the Model 58 at the company's customer support center in Scarborough and by tape recording a complete manual on MiniCobol, the programming language of the Model 58.

"Ruth is preparing the administrative programs that will get our system started. The next priority will be to develop programs that will place the computer at the the service of blind persons in Canada," C. Gordon Graham, CNIB Comptroller, said.

"We hope to compile a large base of information about blindness and apply it in studies on the prevention and treatment of blindness and for the general welfare of blind persons," he said.

"Each program is a clearly defined and unique object which you have made yourself," said Miss Tolton. "And being blind, I have to be better organized than a person who can use his eyes to watch the progress of a job. The result is that I probably make fewer mistakes than I would if I could see."

Colorado River Cataloged

DENVER, Colo. – Two engineering firms have undertaken a project to catalog the past, present and future use of every drop of water in the Colorado and White Rivers in Western Colorado.

With the help of an IBM 85, the scientists will store data such as water rights, virgin flows, periods of drought and water consumption. This information will enable them to quickly analyze potential water supplies for any given time.

David E. Fleming, project manager, believes this "effort will be extended to all rivers in the U.S. to determine the course of future population concentrations."

The Forum and Exhibition Schedule

Each Day

9:00-9:40
Keynote Address

Day One — Lawrence Feidelman
Mr. Feidelman will address the entire audience from 9:00 to 9:40. His subject is data entry, and his experience makes him an expert in this field. Currently he is President of Management Information Corporation of Cherry Hill, New Jersey and editor of *Data Entry Today*. He's an instructor at Drexel University, and recently collaborated with George Bernstein on a 15-year study and projection on the DP industry.

Day Two — Dr. Dixon Doll
Dr. Doll will speak on Data Communications. He is an acknowledged expert in this field, and does consulting work in addition to his activities as a faculty member of the Eastern Michigan University graduate school of business. He is also President of the Ann Arbor Chapter of the ACM.

Day Three — Charles Lecht
Mr. Lecht's subject is Operational Efficiency. He is an internationally known speaker, consultant and author. His programming books are recommended reading for the CDP exam of the DPMA, and he has prepared several lectures for the American Management Association. Mr. Lecht is President of Advanced Computer Techniques of New York.

Each of these speakers will also observe the panel discussions and deliver a summary during the conference luncheon.

9:40-10:30
Panel Discussion

Panelists are regional experts in the particular field. They have first-hand experience with the latest equipment and services, and they are known in their areas for their progressive management principles. They are not representatives of computer manufacturers. Principles and operations are the target for discussion, not equipment suppliers. General questions are encouraged.

10:40-11:45
Workshops

Each panelist leads a workshop — and this is where your specific questions are discussed and worked out. Where the discussion goes depends on your needs. What do you, the user, want to learn or discuss?

12:15-1:30
Conference Luncheon

The keynote speaker summarizes the important points of the day's panels and workshops over a pleasant lunch.

1:00 PM-9 PM
Exhibits Open

You've listened and talked all morning. Now you can see the latest equipment and services in action. 60 exhibitors present their latest, in a pleasant, uncrowded exhibit hall.

TOPICS

On each day of our three-day show we are devoting our forums to a particular topic of wide current interest to computer users.

First Day

DATA ENTRY

The keynote session on data entry is followed by panels and workshops on

- Keypunch Replacement: key to tape, disk and cassette devices
- OCR
- Intelligent Terminals (distributed processing)
- Direct Data Entry/Source Data Automation

Second Day

DATA COMMUNICATIONS: THE CHOICES

The keynote address deals with the overall picture, and is followed by panels on these subjects:

- Communications equipment from mainframe makers and common carriers
- Communications equipment from independent suppliers
- Data Transmission via private (lines, microwave) networks
- Data Transmission via carriers (lines, microwave)

Third Day

OPERATIONAL EFFICIENCY

Panels and workshops deal with the following topics:

- Core Extensions
- System Utility Software Modification
- Independent Peripheral Usage
- Dedicated Systems vs. General Purpose Computers

EXHIBITORS

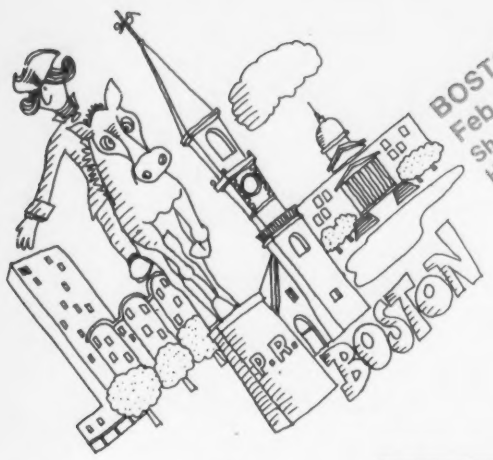
The following is a partial list of exhibitors:

- Lockheed Electronics Company
- California Computer Products, Inc.
- Novar Corporation
- Sanders Data Systems, Inc.
- Incoterm Corporation
- Inforex, Inc.
- Centronics Data Computer Corporation
- Iomec, Inc.
- Hewlett-Packard Company (Cupertino)
- Trendata Computer Systems Corporation
- Techtran Industries, Inc.
- Boeing Computer Services, Inc.
- Graham Magnetics, Inc.
- Digital Equipment Corporation
- Eastman Kodak
- Varian Data Machines
- Tally Corporation
- Interdata
- Sycor, Inc.
- Nashua Corporation
- Hazeltine Corporation
- Applied Data Research
- Texas Instruments Incorporated (Digital Systems Division — Houston)
- Versatec, Inc.
- Itel Corporation
- Input Output Computer Services, Inc.

THE COMPUTER CARAVAN IS BRINGING 60

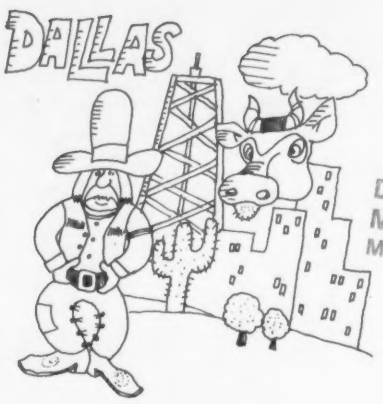
to put 85% of the computer users in of new products, new services

The Computer Caravan is sponsored by Computerworld. And it's designed to give you a chance to spend one, two or three days at a nearby, uncrowded, professionally oriented seminar and exhibition. You'll be discussing the topics that interest you with experts in the field. Experts who are user-oriented. Who know your problems and have first-hand experience with the state of the art. Then you'll have a chance to see the latest equipment and services in action, as 60 companies show you what they have to offer.

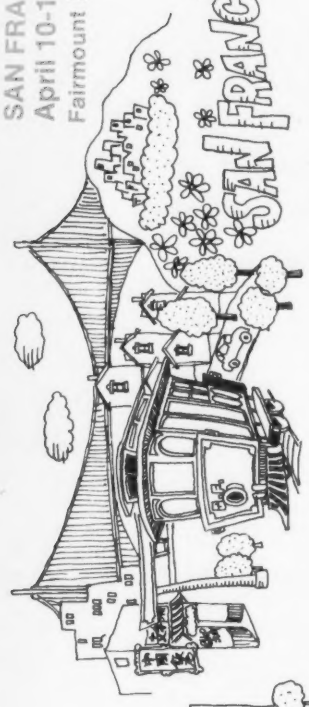


BOSTON
Feb. 22-24
Sheraton Boston/
Hynes Memorial Auditorium

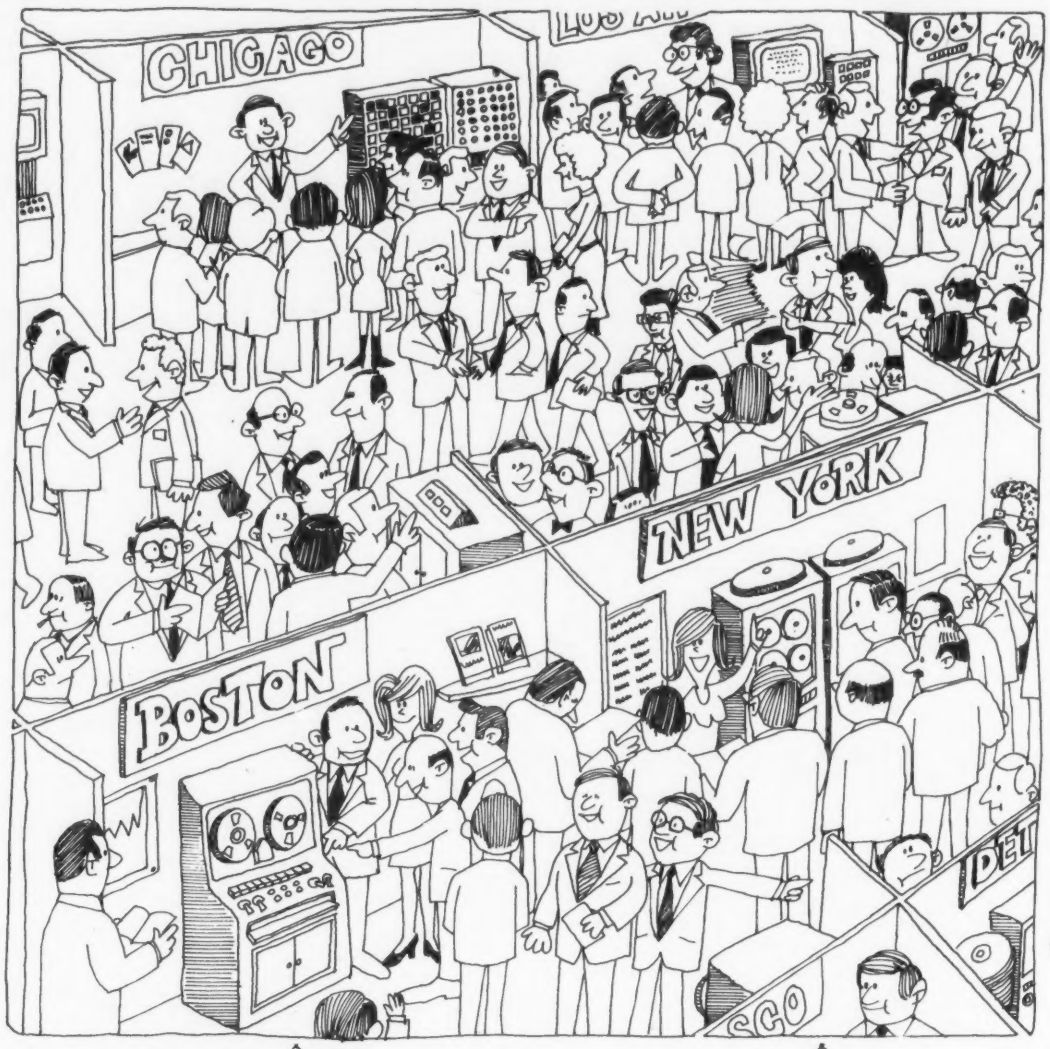
LOS ANGELES
April 4-6
The Ambassador

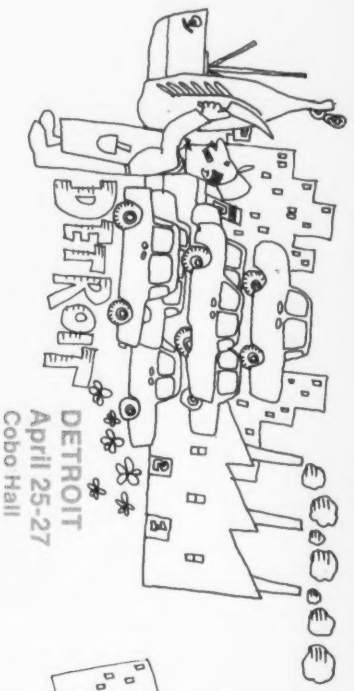


DALLAS
March 21- 23
Market Hall

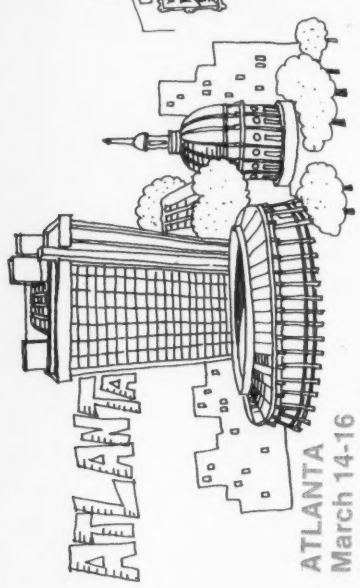


SAN FRANCISCO
April 10-12
Fairmount Hotel

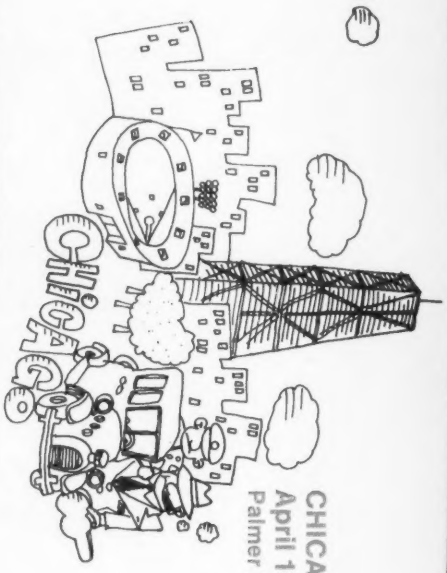




DETROIT
April 25-27
Cobo Hall



ATLANTA
March 14-16
Regency Hyatt House



CHICAGO
April 18-20
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NEW YORK
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COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Random Notes

Magnetic Stripes Encoded, Cards Embossed at Center

DAYTON, N.J. – Plastic credit cards are embossed and attached to individually addressed carriers which are then burst, or folded, and stacked for insertion in evelopes for mailing "untouched by human hands," with a service now available through IBM's Information Records Division facility.

Based on user tape, disk or card files, the service can include encoding of magnetic stripes on the credit cards to meet American Banking Association specifications, a spokesman said.

MetaCobol Features Enhanced; ADR Sets New Price Schedule

PRINCETON, N.J. – The MetaCobol program generator system has been enhanced by Applied Data Research, so that the macro translator feature now includes more than 20 standardized macros and greater flexibility for the user who wants to create his own macros. The test data generator, runtime debugging aid and Cobol performance monitor portions of the system have also been improved, ADR said.

The basic translator is now priced at $4,000 and the macro translator at $3,500. The other features cost $2,000 each, the firm said from Route 206 Center.

30 Char/Sec Terminals Usable In Most Al/Com Network Areas

PRINCETON, N.J. – Thirty char./sec service is now available to subscribers of the Al/Com time-sharing network in New York City, Washington, D.C., and the western and southwestern states served by the network's Reno, Nev., installation.

The faster service is to be extended to users in Princeton, Philadelphia and several midwestern states shortly. Subscribers in Indiana, Illinois, Ohio, Kentucky and Michigan will be provided In-Wats access to the network at that time, the company said from 1 Palmer Square, 08540.

Tymshare Adds Circuit Analyses

PALO ALTO, Calif.,– Public and private semiconductor libraries and common engineering suffixes for both input and output are two features of the Tymshare Transient Circuit Analyses Program (Tymtrac) recently implemented on the Tymnet telecommunications network.

Tymtrac also provides computed outputs which include voltage, current, and power dissipation, and multiple solution time periods and a solution time-step that can be controlled automatically. A special program is available which plots Tymtrac output on Zeta or Calcomp plotters, Tymshare said, from 525 University Ave., 94301.

W 2500 Software Strengthened

ORLANDO, Fla. – A stacked job File Management System (FMS) that operates under either Monitor II or Monitor IV operating systems on the Westinghouse 2500 minicomputer provides disk handling functions in single or multi-task operations.

FMS supports as many as 32 fixed-head or moving head disks, allocating space and protecting data against unauthorized use or destruction. The system includes a Fortran load-and-go compiler, and is available without cost to W 2500 users. Westinghouse is at 1200 West Colonial Drive, 32804.

First Non-IBM Support

XDS Plans APL Processor Under UTS

By Don Leavitt
CW Software Editor

EL SEGUNDO, Calif. – Xerox Data Systems (XDS) has capped an apparently successful year of development on its long awaited Universal Timesharing System (UTS) with the announcement that an APL processor would be available next fall.

If nothing interferes with this schedule – and XDS demonstrated a version of APL operating under UTS at FJCC '71 – it will mark the first generally available implementation of the interactive language on other than IBM equipment.

APL was developed under IBM sponsorship and has been limited to use on IBM 360-370 and 1130 CPUs and 1500 educational systems.

XDS finally released an initial version of UTS early last spring, but even the company wasn't satisfied. It promptly announced that further enhancements would be available by the fourth quarter of 1971.

A half dozen of the planned improvements were ready by the third quarter of the year, XDS said. These included swapper extensions for handling 7212 and 7232 RAD units, and 2741-type terminal support, as well as techniques for recovery of files after hardware or software failures.

An improved batch entry processor permitted entry of programs from on-line terminals or another batch job, while debugging improvements allowed a manager to modify the running system from an on-line terminal.

By December, an improved UTS Basic processor was released, including better file I/O, binary coded decimal and string input. By the end of the year, UTS users could also access Fortran Load-and-Go (Flag), ANS Cobol, Terminal-oriented Manage (a report generating facility), a Data Management System, a choice of simulation packages and circuit analysis software.

Support for multiple batch streams concurrent with time-sharing tasks is expected to be available "in the next few weeks," as is support for several Sigma 9 features. File management capabilities will be extended at about the same time, while the minimum memory size required for UTS will be cut from 81K to 65K words.

'Uaims' Aids OS Host Languages, Data Bases, Teleprocessing Use

EAST HARTFORD, Conn. – Larger OS/360 users who are undecided on the relative merits of "host language" and "self-contained" data base management systems may be able to have the best of both worlds with the United Aircraft Information Management System (Uaims) released by UA's Research Laboratories.

The system includes support for application programs, written in the user's (host's) choice of language, and a self-contained query language to provide what UA calls full facilities for building information systems.

Operating on IBM 360/50s and larger CPUs, under OS/360, Uaims offers Data Management Service (DMS) and teleprocessing support. With DMS, a user can define data structures, file parameters and protection, and specify multiple inverted indexes which are generated automatically, UA said.

A maintenance language is available to update any part of a data base. The data bases can be enlarged, as needed, and can reside on multiple storage media.

DMS is available as Callable subroutines for Cobol, Fortran or Assembly language programs, and supports either on-line or batch environments.

The DMS coding by itself, utilizing overlays, requires approximately 60K of core. With application programs, DMS operations can usually be handled in a partition of 140K to 150K bytes, UA said.

The basic DMS portion of Uaims, written in Fortran and BAL, can be acquired on perpetual lease for $24,000. The teleprocessing support costs another $3,000 and the applications range from $600 to $4,500 each.

IEEE Lists 'Surge' Source Code

NEW YORK – Users are able to retrieve data on the basis of Boolean combinations, and print reports showing detail and summary items with a package called Surge, developed by the Bonneville Power Administration (BPA), Portland, Ore. The package will be available in list form from IEEE Computer Group for $3.

As written, Surge can accept only one input file at a time, and that must be sequential fixed length records on cards, tape or disk. Driven by parameters coded on three parameter sheets, the program can be used in load-and-go operations or as a source code generator for conventional compilations.

Surge logic can control up to 100 levels of totals, BPA said, and includes a sort to reorganize input data prior to the printing of reports. The current version provides some computational capabilities, but no facilities for updating of the input file.

Although Surge is limited in its capabilities compared to some other program generators, the availability of its source code (Cobol) means that interested users should be able to enhance the logic to fit their own needs, a BPA source noted.

Repository Item R72-54, The Anatomy of a Source Program Generator, is available in microfiche for $1.50 or in hard-copy for $3 from IEEE at 345 E. 47th St., 10017.

DOS Phases Made Relocatable With Link-Edit Postprocessor

PINOLE, Calif. – DOS users are able to run programs in any partition, with a package available from Marcus Powell Associates (MPA). Called Anyplace, the package is built around a program which processes a DOS phase after it has been link-edited, to make it self-relocating.

Because Anyplace works with link-edited code, source languages are transparent to it. No control cards are used in its operation and no modifications to IBM components or production JCL are involved, according to MPA.

Anyplace operates by appending a relocation list to the cataloged phase. At execution time a transient, supplied as part of the package, relocates address constants within the phase. The relocation list is said to add about 500 bytes to a typical 60K byte Cobol program.

Also included in the package is the facility to control placement of the relocation table.

The package may be purchased for $1,800 or rented for $60/mo, including source code, operating instructions and documentation. MPA is at 2694 Doidge Ave., 94564.

Manpower Problems Plotted

ATHENS, Ga. – Univac 1108 users concerned with manpower utilization can have exception reports produced as charts on Stromberg Carlson 4020 plotters, with the Manpower Management Information System now available for $700 from Cosmic, where it is cataloged as MFS-21477.

The nine Cobol programs in the system range in size from 9K to 32K words and are designed to provide data in support of control, operating and planning functions.

Standard printed reports are also generated. Cosmic is at Barrows Hall, University of Georgia, 30601.

Inventory Management - Part II

Manufacturers Must Control 'Floating Requirements'

By Richard T. Lilly
Special to Computerworld

Perhaps the most difficult sin to understand is a system's mishandling of "floating requirements." This omission occurs only in the manufacturing environment where demand for a product creates requirements for other items such as assemblies, parts, etc. Consider the following example. Product A is assembled from components B and C. On April 1, customer X orders 100 pieces of Product A for delivery 4/20. There are no Product As in stock. Requirements are generated for 100 pieces of B and 100 pieces of C. The status of component B is: requirements, 100 pieces; on hand, 100 pieces; net available, 0, no replenishment necessary.

Inability to trace both processed and rejected transactions were two "deadly sins of omission" of inventory management system design described in the first part of this series [CW, Dec. 8]. In this installment, R.T. Lilly considers another design "sin" that can create inaccurate balance-on-hand amounts.

April 10, Customer Y orders 20 pieces of A for delivery April 30. Requirements for B and C now equal 120. Status of component B is: requirements, 120; on hand, 100; net available -20, replenishment is necessary, therefore, order economic order quantity (EOQ) of 70.

April 12, the storeroom physically issues 100 pieces of B and C to assembly. The inventory clerk stuffs the paperwork in his pocket. His wife subsequently washes and discards. The erroneous status of component B is: computer requirements, 120; on hand, 100; on order, 20.

A cycle count on April 16 shows none in stock, causing an adjustment to the on-hand balance. The status of component B now is: requirements; 120; on hand, 0; on order, 70; net available -50, replenishment is necessary, order EOQ of 70 pieces.

The problem stems from the fact that the requirement is a theoretical value which is kept in summary form only (time periods are also summaries) and there is no way in which the user can go out to the floor and count these requirements. Since summary figures are involved, any loss of data in the form of input transactions cannot be audited in the normal way.

In the case cited, an issue of 100 pieces for components B and C is not reflected in the summary balance. Hence, the status of this component is erroneous. The requirement for B and C were physically covered.

The summary figure was not updated and still reflects a requirement. As transactions occur against these inventory records, the impact of a single transaction is lost when working with summary figures.

There is now a requirement for 100 pieces of B (and C) floating within the system which can be corrected in only two ways:

- Recycle the entire system: i.e., zero all requirements, physically count all items, and then re-explode all orders; or
- Link each requirement as it is generated to the proper inventory record and to the assembly order which generated the requirement.

The first option must be scheduled on a periodic basis since the items having floating components are unknown. The interval of time between recycles is dependent upon the length of time that floating requirements are tolerable.

But linking (pegging) of requirements does not allow requirements to float. Each requirement is tied both to its inventory record and to the order for the next higher level assembly.

Thus when the orders for customers X and Y were received and logged into the order file, the requirements for the components are pegged both to that order and to their inventory records.

Warehouse Control

Whenever an item is issued to assembly, the quantity issued is posted to the requirement file. No receipt for an order is complete until all requirements have been issued. No requirements are able to float!

Management is responsible for setting replenishment and service policies for inventory. Yet how many systems measure response to these policies so that managers can make effective adjustments?

The most vital management report in a system should be a warehouse control printout. Produced at every update of the file, this highlights fluctuations, trends or out-of-balance conditions.

Fields on the report should include:

- Theoretical Inventory – the target for each warehouse, computed as the sum of the safety stock plus half the order quantity (both in dollars) for each item
- Actual Inventory – the sum of on-hand balances in dollars
- In-Transit – the sum of amounts being shipped to the warehouses
- Dollar Adjustments – in absolute figures (any minus value is made positive) provide a good indicator of how accurate balances are being maintained
- Over Max – shows slow moving stock or improper replenishment orders, and is the amount on hand for any item which is greater than the order quantity plus safety stock
- Released Orders Outstanding – the sum of all outstanding replenishment orders for the warehouse both in dollars and in numbers
- Demand – actual customer demand in dollars and in number, shown both month-to-date and year-to-date
- Unmerited Backorders – the number and dollars of customer orders not-shipped even though stock was on hand in the warehouse
- Open Orders – customer orders which have future ship dates
- Back Orders – past due customer orders for which no stock is available.

"Lumpy" demand for stock is a problem for many systems, but there are ways of coping with it, as Lilly notes in the next installment of this series.

R. T. Lilly is president of Manufacturing Management Sciences Inc., Burlington, Mass.

FCC Hears WU Plan

TWX Users Get Wider Service

NEW YORK – Western Union's TWX subscribers could get a belated Christmas present this month when the carrier plans to offer direct TWX-to-Telex service. To be called the TWX Teleprinter Exchange Service, the plan is awaiting FCC approval.

The new teletypewriter message service will be based on a store-and-forward computer center in Middletown, Va., where a Univac 1108 with a 418 III front-end will process users' messages.

Described by WU as the "largest message switching center in the U.S.," the new installation is expected to handle four messages per second when it gets into full operation.

With the help of the Univac CPUs, Western Union will allow its 40,000 TWX subscribers to directly access a similar number of Telex sites in the U.S., Canada, Mexico, and Alaska.

Up to now Telex users have been able to access TWX sites but service has not been available in the other direction. The main compatibility problem between the two services lies in their different codes and transmitting speeds.

Most TWX users operate at 100 word/min using Model 33 or Model 35 Teletypes. They transmit an eight-level code not directly compatible with the 66 word/min five-level code used by Telex subscribers.

To accomplish the necessary code and speed conversion, special software had to be written for the 418 III front-end which feeds messages into and out of the 1108.

When the TWX-to-Telex service is established there will be some limitations. U.S. TWX terminals will be able to access Canada, Mexico, and Alaska but only on a one-way basis, and users in those locations will not be able to answer directly through the Virginia store-and-forward center.

In addition about 13% of TWX users still operating at 60 word/min with five-level code will not be able to use the new service. Most of these subscribers are using Model 19 and 28 Teletypes, a WU spokesman said.

COMPUTERWORLD

communications

Bell CPU Will Monitor Telephone Traffic Data

By Ronald A. Frank
Of the CW Staff

SEATTLE, Wash. – If some types of users are overburdening the telephone system more than others, a new automated monitoring system being installed here may collect the data to prove it.

Called the Continual Surveillance Data System (CSDS), the monitoring operation is based on an XDS Sigma 3 CPU installed at the Pacific Northwest Bell data processing center.

Of particular interest to communications users will be traffic information related to data calls. Although the Pacific Northwest system cannot monitor individual lines, it will be able to detect heavy trunk usage patterns by types of call, according to a spokesman.

Various Bell System companies have proposed higher phone rates for lines used by time-sharing and other data users. In most of these tariff proposals, the telephone company has been unable to support its claim that data users overburden phone facilities. The most recent case occurred in California [CW, Dec. 22].

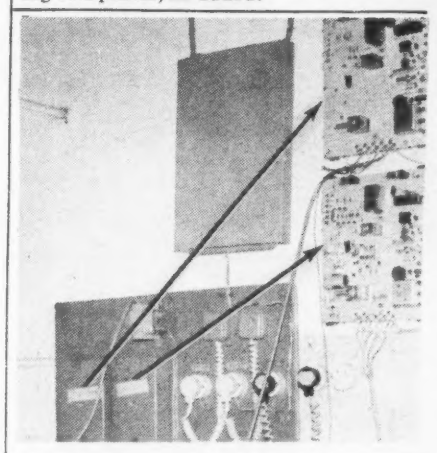
The new CSDS system scheduled to begin operations this month may eventually collect enough data to prove whether any one group of users should be accused of unusual usage. The Seattle and Portland areas, which have a high concentration of data users, will be among the telephone regions being monitored, a spokesman said.

Initially, the Seattle CPU will monitor all local and toll traffic in 30 central office dialing areas located in Washington and Oregon.

The Sigma 3 will be tied-in to "traffic registers" installed at each monitoring office. The registers will scan traffic levels to compare them with preset averages. Whenever the levels are exceeded by unusual traffic patterns, specific data will be sent to the Sigma 3 for analysis.

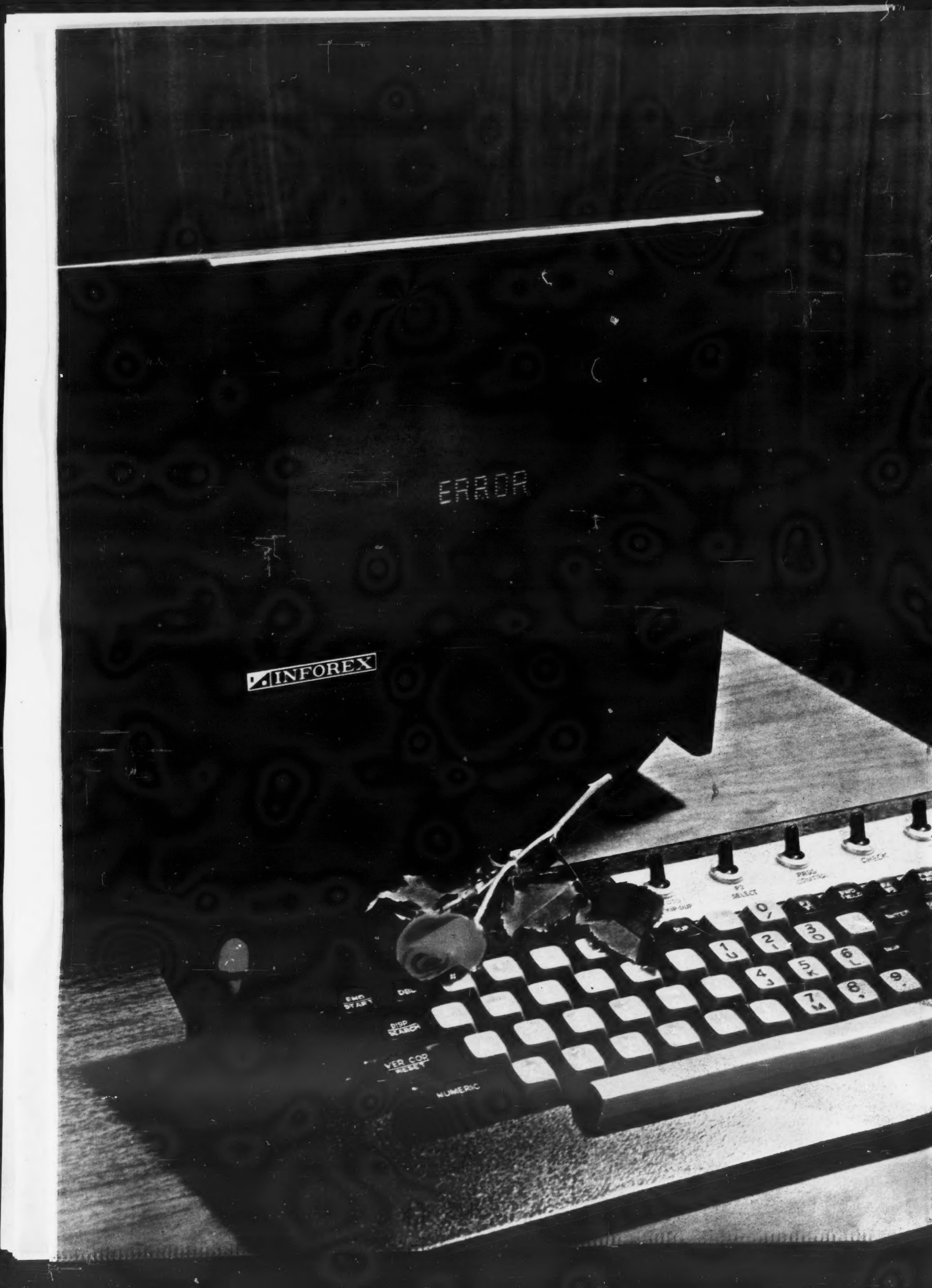
Traffic levels are now monitored manually and new circuits are switched in and out of congested traffic areas after data has been analyzed by Bell traffic maintenance supervisors. The new system will speed up this process and report unusual usage to the CPU.

Asked whether the new system was being installed at AT&T request, a Pacific Northwest spokesman said the surveillance system was still a pilot project. But the surveillance system will use standard AT&T operating codes and could easily be adapted to other Bell System operating companies, he added.



Wall Size DAAs

When the Bell System changed its DAA specifications, wall space became a problem for some users. At this West Coast site, two early F-type DAAs are shown at the lower left. The newer units are shown without cover at the right. Having mercury relays, they must be wall mounted.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Bits and Pieces

Digital Development Has Disks and S/3 Multiplexer

SAN DIEGO, Calif. – A communications based multiplexer for the IBM System 3, the MPX-3, and two fixed head/track disk drives for DEC, Digital Computer Controls, and Data General minis have been announced by Digital Development Corp.

The MPX-3 is designed to interface a variety of devices including teletypewriters, CRTs, disk drives, and 1403 line printers. It provides from 8 to 64 data channels. The unit is priced at $24,000.

The DMS-8 and DMS-16 disk drives range from 64K to 1M word capacity. It consists of a controller, to which up to four drives may be connected, power supply, cabinet and software. Prices of the drives start at $9,000 from 5575 Kearny Villa Road, 92123.

GC-3A Digitizes Maps, Photos

STATE COLLEGE, Pa. – The GC-3A graphic digitizer from Visicon Inc. allows rapid, automatic digitization of photos, maps, and other graphic data with up to seven bits of gray shade data for each sampling point, the firm said.

The drum-type unit provides 50-, 100- or 200 sample/in. Maximum document size is 11 by 17 in. System prices begin at $24,000. Delivery is 90 days through P.O. Box 1008, 16801.

Reader Permits Preset Tests

MAMARONECK, N.Y. – The Sealectrocard SCR-1222 badge reader from the Sealectro Corp. permits automatic preset of test conditions as well as test identification and data paring for EDP processing. Priced from $300 to $600, the readers are available on a 6-week delivery schedule from 225 Hoyt St., 10543.

Cambridge Adds Off-Line Switch

NEWTONVILLE, Mass. – Cambridge Memories, Inc. has added an off-line switch to its 360/Core add-on main memories for IBM 360 models 40 and above, at no extra cost.

The switch is currently available and will enable the mainframe to operate independently after it is uncoupled from the add-on memory module.

Cambridge Memories is at 285 Newtonville Ave., 02160.

79 Curbs Static Electricity

CHICAGO – Static electricity can be eliminated from punched cards and paper tape with a liquid destaticizer from the Merix Chemical Co.

The liquid, called Anti-Static # 79, is used in dilutions up to 1:100. Prices range from $19.79 to $4.79/gallon, depending on quantity. Delivery is immediate from 2234 E. 75th St. 60649.

Wright 5444 Pack Bows

WORCESTER, Mass. – The Wright Line Division of Barry Wright Corp. is now an alternate source for disk packs to be used with the IBM System 3.

Priced at $160 each, the packs are compatible with the IBM 5444 drives and are available from stock from 160 Gold Star Blvd. 01606.

Correction

In CW, Dec. 15, the price of the Documation Inc. mark sense option should be $850.

Retrieves Them, Too

PDR-5 Stores Large Files on Microfilm

By Frank Piasta
Of the CW Staff

WESTBURY, N.Y. – The Laser Microfilming, Inc. PDR-5 Archiving Data System is designed to allow the user with massive long-term files to store data on microfilm in a machine-readable format.

The process not only allows expensive mag disk packs and tapes to be released for other uses in the installation, the company said, but also eliminates some of the problems inherent in long-term storage of magnetic tape.

These problems, according to the company, can include cross-talk, print-through, stiction (adhesion of the tape to itself) and the gradual deterioration of recording quality.

The microfilm medium used in the PDR-5, the company said, is virtually archival with a life of at least 50 years. The more compact nature of the film can reduce storage space required. Thirty reels of magnetic tape can be copied to a 10-1/2 in. 2,000 ft reel of film.

The PDR-5 uses a laser to record 36 channels of data on 8 mm film. A coherent monochromatic beam generated by a gas laser is shaped by a lens train into a strip of light 0.008 in. wide. A modulator separates the strip into 36 channels.

Condensing lenses are used to compress the array to a 0.252 by 0.0002 in. format recorded along the film in terms of continuously variable exposure levels similar to that of a motion picture sound track.

The light signals continue through the film to an expansion lens system and photodetector to permit real-time read-out of the data being recorded. Data can also be read from the film using the same system.

The PDR-5 system consists of the PDR-5, a minicomputer used as a buffer-controller, and a data source which can be a mag tape transport, computer I/O channel or other data handling equipment.

The system is adaptable to almost all larger computer systems and digital I/O devices, the company said.

The company also offers a read-only version, the PDR-6, for users who want LMI to make the recording or need satellite stations for play-back only.

Complete PDR-5 systems, including necessary hardware, interconnections and software, range in prices from $135,000 to $190,000. The read-only PDR-6 is about $30,000 less. First shipments are scheduled for June 1972 from 800 Shames Drive, 11590.

Telefile System Connects Minis To 2311, 2314 Compatible Disks

IRVINE, Calif. – Users of most minis and several maxi computers will be able to connect 2311- and 2314-compatible drives to their CPUs through the DC-16 Discfile System from Telefile Computer Products.

The company, which also supplies drives to form a complete storage facility, will supply interfaces to match the drives to such minis as the Varian 620, Data General Nova 1200 and 1800, EMR 6130, DEC PDP-11 and -15, CCI-7000, Lockheed MAC-16 and -Jr., Interdata 3-4-5, Honeywell 315 and 516, and SEL 810.

In addition, interfaces are available for the DEC System 10, Univac 418 II and the XDS Sigma 5 and 7. Others can be made to order, Telefile said.

The system can handle up to nine drives, with one as a spare. Demands on the processor are minimized, the company said, by having the controller perform all the functions normally performed by software.

The device features simultaneous seek operations, programming simplicity involving eight commands, read or write multiple records with a single command and direct data transfer to or from memory.

Prices for the interface/controller range from $8,000 to $18,500. A disk system with one drive will range from $17,000 to $27,500. Prices include diagnostic software. Delivery is immediate from 17785 Sky Park Circle, Box AO, 92664.

Minis Use ROMs, Not Software

OCEANPORT, N.J. – Two minicomputers from Interdata, Inc., intended for data communications applications, use customized ROMs in place of software to achieve better price/performance ratios.

The Model 50 is a 16-bit unit featuring an 80 nsec ROM with micro-instruction time of 359 nsec. Main memory is expandable to 64K bytes, with an access time of 300 nsec and a 1.0 μsec cycle time.

The instruction set is designed to accommodate communications I/O as well as service 255 priority interrupts with automatic vectoring, chaining and queuing. Interrupt response time is 10.5 μsec, average latency is 4 μsec, the company said. The selector channel moves data at 2,000 kbyte/sec.

The Model 55 is a 16-bit dual-processor system providing a 500 nsec instruction execution time when both processors are used in parallel.

The general processor in the Model 55 includes hardware multiply/divide, 32-bit floating point arithmetic, 16 register, solid-state ROM, up to 255 I/O channels and interrupts, and 113 program instructions.

The data communications processor includes a data communications instruction set, 16 registers, and an ROM.

With 8K bytes of core memory, the Model 50 sells for $6,800. The dual-processor Model 55 communications system with 16K bytes of core sells for $15,900. Interdata is at 2 Crescent Place, 07757.

Scan-Data Scan-Plex Feature Speeds OCR Error Correction

NORRISTOWN, Pa. – The Scan-Plex feature available on 200, 250, 300 or 350 OCR units from Scan-Data Corp. allows the re-entering of rejected characters, with no extra keystrokes, with or without document retrieval, and with little or no impact on machine throughput, according to the firm.

As documents are scanned, the company explained, correct data as well as video images of rejected characters are written to a disk drive without interruption of the scanning process. Images of the rejects with adjacent characters are written to a disk.

The operator corrects the erroneous character by retrieving the file from the disk, the company continued. The non-recognizable characters are displayed on a CRT. The error is corrected through a keyboard and written to magnetic tape as part of the final output record. Retrieval of the source document is not required and scanning activity of other records is not interrupted, the firm said.

The Scan-Plex system includes a CRT, disk drive and an additional 4K of memory, in addition to the special hardware required.

A special software package is also supplied, consisting of several modules. These include the Snapscan – to capture a video image of the rejected and adjacent characters, Scanfile – to provide file management and control disk activity, and Rescan – which examines the data stream for rejects as it is being retrieved, and displays the rejected characters.

The first Scan-Data system equipped with Scan-Plex is scheduled for shipment in March 1972. The feature is priced at $12,000 and leases for $300/mo from 800 E. Main St., 19401.

Datatrol Turnkey Bank System Uses On-Line Voice Response

HUDSON, Mass. – Intended for use by commercial banks, the Datatrol Teller Information System 370 is designed to automate account inquiry and status update procedures.

The TIS-370 is a free-standing voice response system that operates independently of a bank's central computer. In addition to providing inquiry and updating for demand deposit, savings, and installment and mortgage loan accounts, the system can provide bank officers with current account status information, the company said.

The system is based on a DEC PDP-8/E minicomputer with 8K words of memory, expandable to 32K. Line printers, card reader and CRT displays can be added.

A console teletypewriter and a mag tape transport are included in the system, with the teletypewriter used for program loading, diagnostics, account modification, report printouts and system inquiry.

The mag tape transfers updated data from the bank's central computer to the TIS system's disks each time new trial balances are run. At the end of the banking day, the TIS transactions are transferred from the TIS disks to the mag tape for processing on the central computer.

The basic voice response system can be accessed by four tellers simultaneously to handle a peak load of 160 call/hr and can be expanded to 64 access lines, Datatrol said. After an extension number is dialed, the system asks for ID number, account number and inquiry code, which are entered through a Touch-Tone keyboard.

In case of an inquiry the unit provides the information requested. In case of a check cashing or withdrawal, a hold is placed on the account.

The price of a turnkey system, capable of handling 100,000 accounts and 1,000 transaction/day is about $90,000, with monthly leases beginning at around $1,800. The prices include system design, systems and applications programs, documentation, installation, training and checkout.

Teller accesses Datatrol TIS-370.

The first TIS-370 system will be shipped early this month from Kane Industrial Drive, 01749.

Computer Optics' CRT Terminal System Can Handle 64 Users

BETHEL, Conn. – The CO/75 CRT system from Computer Optics features modular design and can be used either as a stand-alone terminal or as part of a multi-terminal system.

The package, consisting of a central control unit and up to 64 interactive alphanumeric CRT terminals, permits two way communication with third generation computers over telephone lines. An 11 in. by 8-1/2 in. CRT with a capacity of 3,000 characters is used.

The control unit contains up to four modules each controlling the memory, timing, character generation and editing functions of up to 16 terminals. The system is capable of transmitting up to 9,600 bit/sec and users can select any speed in the 110- to 9,600 bit/sec range.

An 88-character set, vertical and horizontal line drawing, underscoring, and simple graphics capabilities are included.

Prices of the CO/75 range from $3,000 to $8,500 per display. On a one year lease, prices range from $85/mo to $275/mo. Computer Optics is at Berkshire Industrial Park, 06801.

Bits & Pieces

Add-On PDP-11 Memories Feature Price, Partitions

DENVER, Colo. – Two models of the NM-8000 memory from Nemonic Data Systems, Inc. offer the PDP-11 user mass memory at lower prices.

The 16K NM-8316 and the 32K NM-8332 feature low cost, speed and partitionable memory capability, the company said. The partitionable feature provides software or program protection from accidental wipe-out, the company explained. Memory may be protected in increments of 1/16 of the total memory.

The NM-8316 costs $9,873 and the NM-8332 sells for $13,202 from 1301 W. Third Ave., 80223.

Keyboard-Printer Terminal Offers Non-Impact Typehead

SUNNYVALE, Calif. – A keyboard printer from Anderson Jacobson, Inc. features a wide carriage, non-impact printing and print speeds of 10-, 15-, or 30 char./sec.

The thermal printing method eliminates noise as well as the mechanical complexity of impact printers, the company said.

The printer accepts paper 15 in. wide, and can print 140-char. lines. Left and right margins are adjustable. The horizontal tab can be set, cleared and activated by the computer.

The terminal is priced at $3,950 or $155/mo and is available for immediate delivery from 1065 Morse Ave., 94086.

Ferroxcube Adds Bump Memory

SAUGERTIES, N.Y. – Ferroxcube has added auxiliary "bump" storage and storage protection to its Mark 6000 line of IBM-compatible memories at no extra cost.

The auxiliary storage in IBM computers is used for multiplex channels to address peripherals, Ferroxcube explained. The addition of this feature permits the replacement of IBM 360/30 memory with the Ferroxcube unit, the company said.

The Mark 6000 core units are available on a 90-day delivery schedule from Mount Marion Road.

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From a company who's come of age.

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We used to be called MAI Equipment Corporation. But we've outgrown that name. That was fine when we were a company with a single idea -- purchase leaseback of unit record equipment.

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MAI Equipment Corporation was a fine name when we were smaller. But now we've developed one of the largest independent marketing organizations in the U.S., with over 40 offices.

And MAI Equipment Corporation was perfectly suitable when we had only a few customers. But now we do business with 300 of the Fortune 500 companies. As well as more than 2700 other leaders in the American business community.

So you see, we do have something to celebrate. We have come of age. We've changed our name. And, as GENESIS ONE implies, we've begun a new era.

We intend to step up our efforts to bring to the data processing industry the high-technology engineering benefits of smaller companies, backed by our own technical know-how. And we intend to continue our efforts to lower our customers' costs of data processing.

All of which means you have something to celebrate, too.

* Void in Idaho, Missouri, Washington, and wherever prohibited or restricted or taxed.

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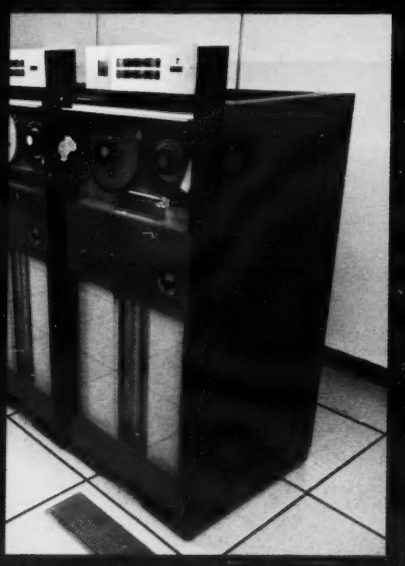

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AMA to View DP 'Collision'

By a CW Staff Writer

NEW YORK – Radical changes that take place in the information systems environment when "users and the system collide" will provide one of the focal points for the 1972 systems conference of the American Management Association (AMA).

Answering the question, "who is the user?" will be one aim of the 18th annual conference, AMA said. The meeting will take place March 6-8 at the Americana Hotel here.

Three morning sessions will be geared to new challenges and problems created by advanced computer technology and a "more militant and sophisticated user," AMA noted.

There will be two afternoons of eight concurrent sessions, offering specific facts and developments in the computer field, for example, the ramifications of the tax ruling IRS 71-20.

Other User Topics

Other developments to be discussed in the concurrent sessions will include product recall systems, financial data bases, manpower management and computer contracting.

The question of "who is the user?" will suggest two possible answers: computer professionals who must use the products of technology "in order to produce information," and corporate officers or line or staff managers "who must make decisions based on computer-generated data."

Discussion might lead to the conclusions that the true user is "an integration of both answers," AMA hinted, with the computer professional and the manager "acting in synergy to make corporate profit objectives a reality."

AMA has named three chairmen for the 1972 conference: Benjamin Alfano, senior vice-president of Rhode Island Blue Cross/Shield, Glen A. Fowler, vice-president of Sandia Laboratories, and Paul A. Strassman, corporate director of Information Systems, Xerox Corp.

Information is available from 135 W. 50th St., 10020.

Societies/User Groups

High Attendance Seen For Winter Meetings

LAS VEGAS – Trade shows may be experiencing the winter doldrums, but at least two user groups are gearing up for conclaves at either end of the country.

A new attendance record is anticipated for the Mark IV User Group, which will hold its winter meeting at the Sahara Hotel here, Jan. 24-26. The summer meeting in Washington drew more than 170 users, according to President Ron Kaetzel.

Mark IV is a proprietary file management system developed by Informatics Inc. of Los Angeles.

In New York City, timesharing users will gather for the second general meeting of the CSShare Users Association, at the Roosevelt Hotel, Feb. 16.

Formed last May as an independent group of users of the National CSS Inc. timesharing system, the association hosted about 80 members at its first meeting last fall.

Language workshops and discussions of new changes and facilities are planned, according to the association's Acting President, Albert Kolkin, RCA Records.

Information on the Mark IV meeting is available from the user group at Box 1452, Canoga Park, Calif. 91304.

ADR Users Advance

PRINCETON, N.J. – A permanent, self-governing user group is the goal of an "interim committee" elected to establish future guidelines for the Applied Data Research (ADR) User Group.

Recommendations of the committee are to be distributed to all users of ADR's software products this month. Attendees of the group's first meeting last month agreed the group should "collectively define and communicate" software user needs and problems to the company, for subsequent action and resolution.

The user group was originally formed by one of the company's vice-presidents.

Top Titles Taken by Users

The new year brings new responsibilities to members of several societies and user groups, which elected top officials during meetings late last year.

Joe E. Mayfield, of the Michigan Credit Union League, has been elected president of the Digitronics Users Association for 1972-73.

Robert J. Kyle is the new president of the American Society for Information Science (Asis), and John Sherrod is president-elect.

Mike Verbick has been elected president of the Computer Operations Management Association, a Chicago-based management trade association.

Book Review

Here's a Bibliography For Active Computer User

By Alan Taylor
Special to Computerworld

Quarterly Bibliography of Computers and Data Processing – A Cumulative Index to Computer Literature, 191 pages, Applied Computer Research, 8900 N. Central Ave., Suite 208, Phoenix, Arizona 85020, Single Copies, $10, Annual Subscription $29.50.

The current quarterly review is the third one, and contains abstracts of items published between January 1968 and September 1971. My copy left the publisher's office Nov. 2, just a month later. This means the quarterly is genuinely up to date – and that is something I have not been able to say about bibliographies in the computer field before.

Already listed, for instance, is the Professional Viewpoint page which began in *Computerworld* in September.

There are a number of other items which have not been around before. The QBCDP Editorial Policy says the book is "Designed primarily for those individuals who are actively engaged in the practicing end of the computer profession . . ." For computer users, and for systems analysts and program designers this is a welcome relief from the bibliographies designed primarily for the research end of the industry.

I find entries like "Memories" or "Microfilm" quite adequate to break down the complex subjects involved in data processing without having to take into account the various engineering designs involved.

The coverage provided in the QBCDP is also suited to its editorial purpose. A breakdown is provided in particular areas between books and articles that appear in periodicals.

Within each write-up a small, generally one sentence, description is given to help the user of the QBCDP to find the area he likes. These can be short as, "Six suggestions to help reduce EDP employee turnover" (Kitt's *"Reduced Job Hopping"),* or quite detailed, as where Smith's *"Information Systems for More Effective Use of Executive Resources,"* is described as, "Presents a theoretical basis for personnel information systems, explains the nature of data input, and shows how management science models can be applied to yield better decisions regarding the management of executive resources."

The Bibliography ranges from Accounting to Voice Answerback and has approximately 65 entries per page. The coverage comes from 94 publishers and 66 periodicals.

Naturally one is never satisfied. An occasional page is included with offset somewhat obscuring the printing; the list of sources does not include details of the back-issue policy and prices for the periodical articles; there is no author index, and the glossary and subject guide is spread over 13 pages which does not allow for a quick-at-a-glance survey of the entries used.

But these are all very minor objections. For speed, quality of abstracting, arrangement and subject matter I know of no better bibliography for the active computer user and can wholeheartedly recommend it.

Alan Taylor, consultant, writer, and former editor of Computerworld, is president of Computer Management Aids Corp. of Framingham, Mass.

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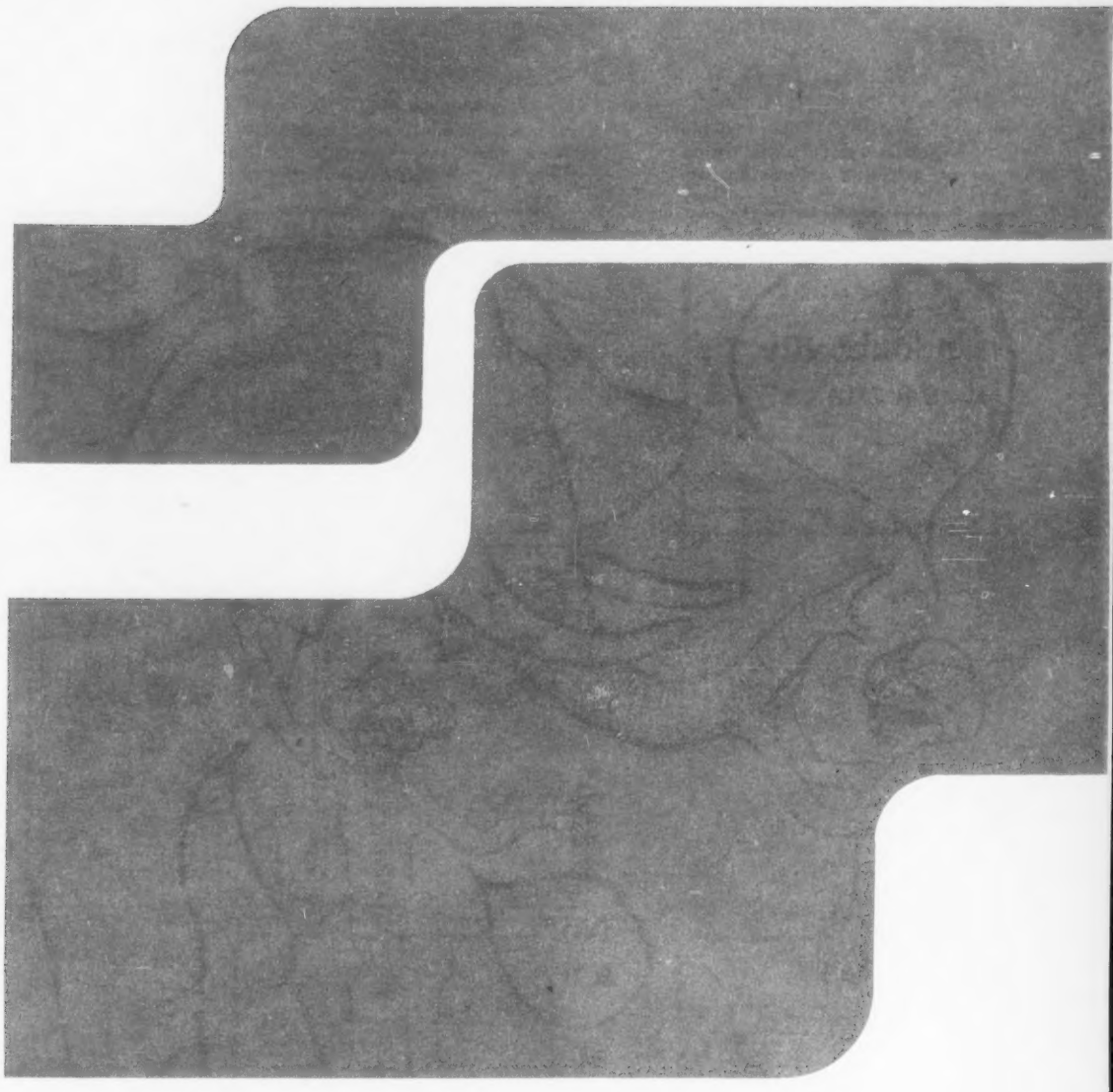

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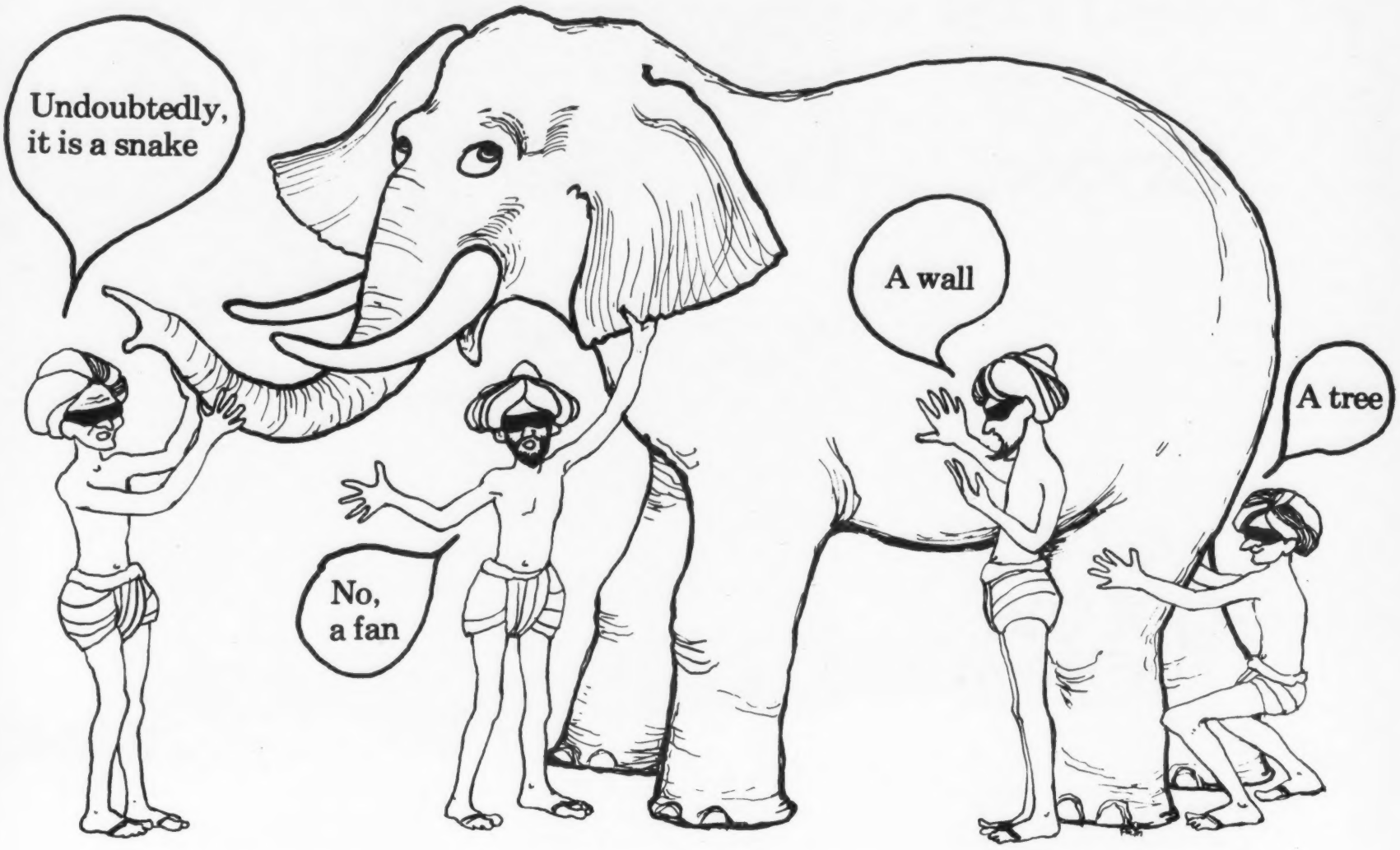

Our personalized Business Information Service gives you the whole picture at one time

Like most executives, you probably get your business information in bits and pieces. It comes in many forms; arrives at different times. Your desk gets cluttered with industry journals, newsletters, reports, and newspapers. There never seems to be enough time to read any but the few best. Because your information arrives at different times, it is also difficult to analyze developments or relate news items you read about in a journal one day to a newspaper report you see ten days later.

During the past year, thousands of executives, at all levels, have found a new way to really keep up with industry developments. As a result, they now *read far less* and yet *know much more* about their business. They spend less money on subscriptions and get more complete coverage. They spend less time reviewing developments and more time planning solutions.

They are subscribers to Computa-Data, a personalized business information service which is totally *unlike* any subscription you have ever had. Here's how it works. You tell us, in advance, the business subjects that are relevant to you. Each month, your "interest profile" will be exposed to a computerized file containing thousands of digests of new articles published during the past thirty days in over 1600 business publications and other sources, world-wide. (We also translate over 80 foreign language publications each month.) Our unique computer system will then select for you every article that is relevant to your "interest profile" and will print out detailed digests of these articles in one 8½ x 11 report, completely indexed, cross referenced, and source-documented. Each month your Report is then rushed to you by first class mail. In effect, you will have your own, personal trade journal, made up exclusively for you, to your specifications. You may even change your "interest profile" as often as you like, at no extra cost.

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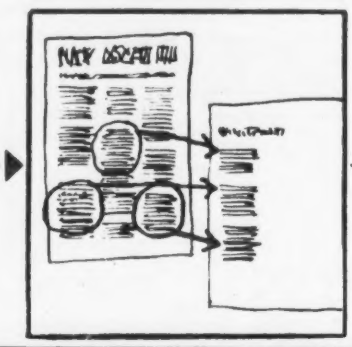
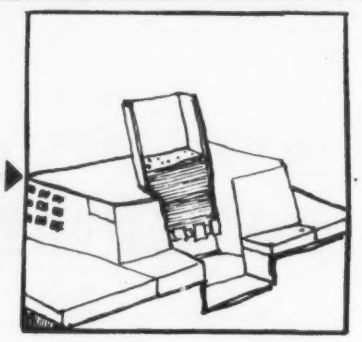
Each source is carefully reviewed and analyzed by skilled industry specialists and every relevant article selected for digesting.

...Your selected subjects are then keypunched to comprise your "interest profile."

Each article is accurately digested to include all the facts in the original, less any excess verbiage.

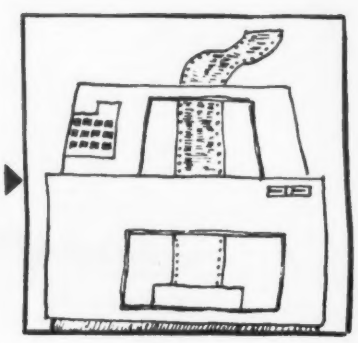


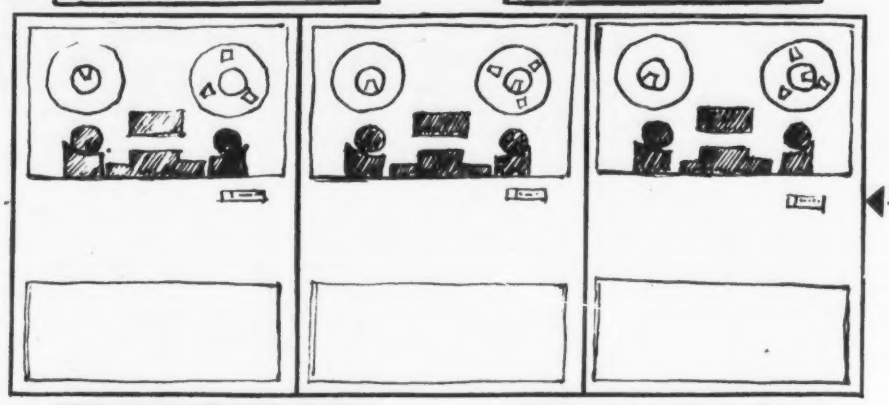
Each month, your "interest profile" cards are then exposed to the new month's file of 6,000 abstracts. A unique computer system then examines every article for relevance to your interests.



About 6,000 digests per month are then entered into our computer system.

The computer selects every article among the 6,000 that are 100% relevant to your interests and prints out the digests on 8½ x 11 paper. Report is collated, bound and rushed to you by first class mail.





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(check boxes opposite desired subjects)

1 Products

- ☐ Components
- ☐ Computers
- ☐ Input Devices
- ☐ Minicomputers
- ☐ Peripherals
- ☐ Services
- ☐ Software
- ☐ Supplies
- ☐ Terminals

2 Analysis Factors

- ☐ Abuses
- ☐ Applications
- ☐ Contracts
- ☐ Costs
- ☐ Education
- ☐ Foreign Trade
- ☐ Installations
- ☐ Languages
- ☐ Leasing
- ☐ Legislation
- ☐ Licensing
- ☐ Litigation
- ☐ Malfunctions
- ☐ People
- ☐ Prices
- ☐ Regulations
- ☐ New Products
- ☐ New Services
- ☐ New Systems
- ☐ Patents
- ☐ Investments
- ☐ Mergers & Acquisitions
- ☐ Marketing Trends/Forecasts

3 User-Markets

- ☐ Accounting
- ☐ Banking
- ☐ Insurance
- ☐ Military
- ☐ Communications
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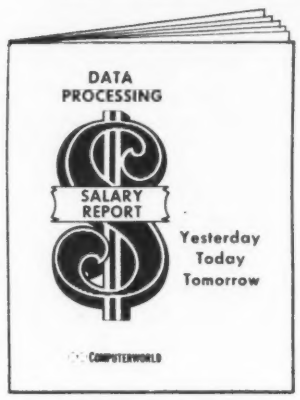

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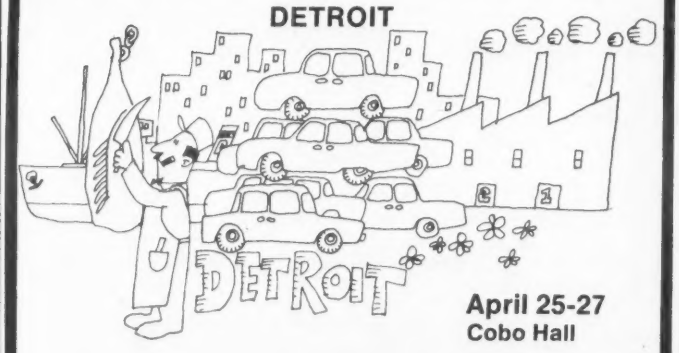

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Chances are, conventional tape won't perform properly on the new high-speed drives.

So, if you're buying anything less than Epoch 4 right now, your investment may soon be obsolete.

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computer industry

a Computerworld news section about the nation's fastest growing industry

January 12, 1972

CI Notes

IBM Prexy Predicts Upturn

ARMONK, N.Y. – "The time has come for us to put unnecessary caution aside, plan for the future with confidence that inflation is being brought under control, and demonstrate American business initiative in lifting the economy to new record levels in 1972 and 1973," declared IBM Chairman of the Board T. Vincent Learson, in his year-end statement.

Citing agreement among industrial nations on exchange rates and Phase Two controls and growing consumer confidence, Learson asserted: "Businessmen now have good reason to turn their backs on 1971 and concentrate on making the investment expenditures which are so necessary if the U.S. is to become competitive worldwide and attain its social and economic goals."

"Governments are now in a much better position" to bolster "business and consumer spending in their countries. This not only will strengthen the whole world economy, it will also help American exports and earnings of multinational firms."

Univac Buys Data Products 7114

PHILADELPHIA – The Univac Division of Sperry Rand Corp. has agreed to purchase a number of units and the patent and manufacturing rights of the Data Products Corp.'s System/7114 large disk store.

The 7114 was offered by Data Products as a plug-to-plug compatible device to replace Univac's Fastrand II.

"The terms of the agreement specify that Univac will purchase Data Products Corp.'s existing leased inventory of disk files," said Data Products President Graham Tyson.

The total value of the agreement is about $3.5 million, in addition to future potential royalties, according to Tyson.

Comma Gets GSA Pact

NEW YORK – Comma Corp. has received a contract from the General Services Administration (GSA) to maintain 18 government-owned IBM computer systems used in five government agencies in the Washington, D.C., area.

The maintenance contract "is the largest ever awarded to an independent, or third-party, computer maintenance company," according to R. William Grenier, vice-president for government marketing. The agencies involved are GSA, Housing and Urban Development, Navy, Army and Air Force.

Supershorts

A Latin American computer systems consortium, the Intercomp for Inter-Americana de Computacion has been formed. The group will have headquarters in Caracas, Venezuela, with offices in Sao Paulo, Buenos Aires, Bogota and Washington, D.C. Six firms initially comprise the consortium.

– – –

The Invitational Computer Conference will display minicomputer and peripheral equipment for OEM system integration in Fort Lauderdale, Fla., on Jan. 17. Future sites will be Dallas, Texas; Newton, Mass., Anaheim, and Palo Alto, Calif.

Year-End Study

DP Shipments Expected to Climb Again

NEWTON, Mass. – After a two-year slump, the computer industry is poised for a jump back to its "normal" 15%-20% growth levels.

That is the major conclusion of a year-end forecast of the direction of the computer industry published by International Data Corp. here.

"For the next two years, at least, our studies indicate that shipments will again increase at rates of 18% or 19% rather than the relatively flat levels of the last three years. At the same time, net yield will improve," according to Patrick J. McGovern, IDC president.

During 1971, U.S. computer manufacturers shipped equipment valued at around $7.4 billion, according to preliminary estimates from the firm.

At the same time, however, computer users returned or retired equipment valued at over $1.4 billion, IDC said.

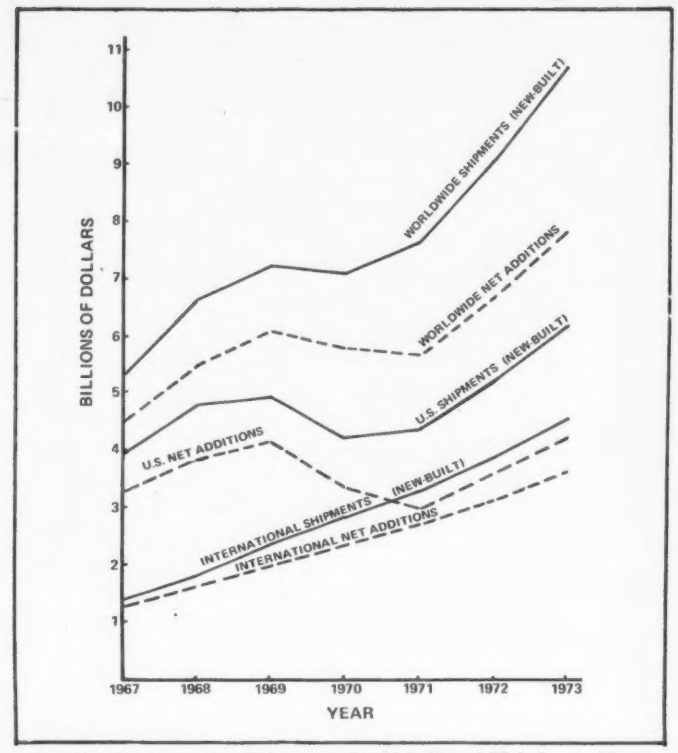
The firm noted that the rate of retirements seems to have stabilized and net additions to the installed base are expected to increase again after two years of decline in value (see accompanying chart). (Net additions to the installed base are determined by subtracting the returned or retired systems from the total of new shipments.

From the graph of new additions, it is obvious that the international market has been behaving in a more stable manner than the domestic U.S. market.

Shipments have held at a steady rate, while returns have also stayed steady. The "yield" for international shipments – the ratio of new-built shipments to net additions – has gradually changed from 19% in 1966 to about 78% this year, according to IDC's *EDP Industry Report.*

In the U.S., however, there was an almost 80% yield in 1969, but this figure plunged to a yield of 60% last year, the report said.

While IDC expects the international market to continue to report a yield of around 70%-75% for the next several years, it estimated that the U.S. yield would remain around 65% next year.



Worldwide Computer Shipments by U.S.-Based Mainframe Manufacturers (Copyright 1971 by International Data Corp.).

Shipment Sweepstakes

IBM shipped $4.8 billion or 64.9% of the equipment, IDC said, noting that 1971 shipments for IBM were up 10% from the value of equipment shipped in 1970.

Second in the computer shipment sweepstakes was Honeywell with shipments valued at $615 million for an 8.3% share of the 1971 shipments. However, Honeywell's 1971 shipments were at the same level as the firm's 1970 shipments.

Univac grabbed the third spot with shipments valued at $470 million for 6.3% of the market, a 1% increase in shipments over 1970. Univac was followed closely by Burroughs which chalked up a 13% increase with shipments valued at $440 million for a 5.9% share of the shipments.

NCR had a gain of 2% in 1971 shipments over the 1970 period, and shipped equipment valued at $290 million for a 3.9% share.

Rates Slipped

RCA, Control Data and Xerox Data Systems all fell badly from their rate of shipments in 1970.

RCA shipments valued at $255 million were off 6% from shipments a year earlier, and Control Data shipments were off 3% to $200 million. Xerox, with shipments of $55 million, was off 11% from the year-earlier figures.

Digital Equipment Corp. showed major strength during the year, with the value of shipments increasing by 13%, placing it in a tie with Burroughs for the largest percentage gain during the year.

In total the industry showed an 8% shipment gain in 1971 over 1970, according to the firms' preliminary figures.

"This ends a tumultuous two years during which the end of a computer generation cycle coincided with an economic recession," McGovern said.

Data Products Fast Core Unit Priced Below Semis

WOODLAND HILLS, Calif. – A high-speed core memory system for minis and other computers has been developed by Data Products Corp.

The Store/333 random-access memory has a full cycle time of 750 nsec and an access time of 325 nsec.

While the speed of the new core memory is equal to or faster than most MOS semiconductor memories, Data Products said, the cost for a complete system in OEM quantities is about 1 cent/bit less than comparable-capacity MOS semiconductor memory systems.

New OEM Products

The Store/333, a planar memory, is tailored for computer manufacturers as a new or replacement memory. It has a basic 8K-word by 18-bit core matrix, expandable in a 5-1/4 in. chassis to 32K by 18, or to 65K by 18 in an 8-3/4 in. chassis. By daisy chaining, the memory can be expanded to 262K words by 18, the firm said.

Store/333 uses +5 and -15 Vdc. A byte-control feature is available. This option is an independent read/restore and clear/write operation in the two halves of a word.

Data Products is at 6219 DeSoto Ave., 91364.

Intel Puts CPU on a Chip

SANTA CLARA, Calif. – Intel Corp. has introduced a monolithic central processing unit complete with a 4-bit parallel adder, 16, 4-bit registers, an accumulator and a push down stack all on one chip.

The CPU is one of a family of four new ICs that form Intel's MCS-4 microcomputer system.

Systems are assembled from a family of four dual in-line packages: Intel 4004, the central processor, which has a set of 45 instructions; Intel 4001, a ROM which stores programs and data tables in a 256 word by 8-bit format; Intel 4002, a RAM with 320 bits of read/write memory; and Intel 4003, a 10-bit serial-to-parallel register which expands the output ports.

A fully functioning microprogrammed computer can be built with two ICs – one CPU and one ROM. A system with 4K 8-bit bytes of ROM and 5K bits of RAM can be built using no circuitry other than ICs from this family of four, according to Intel.

Prices in 100-piece quantities are: Type 4004 CPU, $30; Type 4001 ROM, $18; Type 4002 RAM, $15; and Type 4003 register, $3, from 3065 Bowers Ave., 95051.

Pertec Unveils Buffered Tape

LOS ANGELES – Pertec Peripheral Equipment has announced a buffered magnetic tape system designed to enhance the capability of tape-oriented minicomputer systems and permit efficient, high-speed asynchronous digital data acquisition.

The unit offers asynchronous read or write operation in either 7- or 9-track NRZI or 9-track phase-encoded tape formats at about the same cost as a conventional incremental magnetic tape system, according to Pertec.

The new system, IBM and Ansi-compatible, utilizes Pertec's synchronous tape transports, along with a new buffered formatter that provides asynchronous transfer to and from the transports.

The buffered system allows transferring blocked NRZI or phase-encoded formats at rates up to 1 Mchar./sec, asynchronously.

Using a dual-buffer option, data can be transferred continuously at rates up to 60,000 char./sec (phase encoded) or 40,000 char./sec (NRZI), witn zero data loss, the firm said.

This is achieved by transferring data into one-half of the buffer until that half is full, and then switching data into the second half while data in the first half is being written on tape.

Buffer sizes can be from 256 to 2K characters. Pertec's 5000-, 6000-, or 7000-series synchronous tape transports provide tape reel sizes of 7 in., 8-1/2 in., or 10-1/2 in. These transports include phase-encoded, 1,600 char./in., 9-track units; multi-density 7-track NRZI units; and 800 char./in., 9-track NRZI transports. Transports are available for read-only, write-only, read/write, or read-after-write applications.

Pertec is at 10880 Wilshire Blvd., 90024.

Signetics' ROM Generates Ascii

SUNNYVALE, Calif. – A high-speed 3K-bit MOS static read-only memory integrated circuit that generates the Ascii font is available from Signetics for use in vertical-scan column-output CRT displays, printer character generators, panel displays and billboards, for code conversion, and in microprogramming applications.

Organization of the Signetics 2516 is 64 by 6 by 8 (64 characters, each of which consists of eight 6-bit columns). Typical access time is 450 nsec. All inputs operate at a level of 5 V and can be driven directly by standard transistor-transistor logic (TTL) and diode-transistor logic (DTL) integrated circuits. The 2516 requires power sources that supply +5 V, -5 V, and -12 V.

The unit employs a column, tri-state output which is controlled by "chip enable" for interconnection with bus-organized EDP systems. The data ouput buffers are capable of sinking more than 1.6 mA, sufficient to drive one standard TTL load.

Versions organized into 256 or 384 words of 8 bits each and 768 words of 4 bits each are also available.

Price of the 2516NX, the standard Ascii font character generator, is $19.50 in quantities between 100 and 249. Signetics is at 811 E. Arques Ave., 94086.

Macro Offers 1403 Interface

CULVER CITY, Calif. – Macro Products Corp.'s new M403 printer controller is designed to interface the IBM 1403 printer to most computer systems, including many minis.

The controller contains power supplies, hammer drivers, paper feed tape loop electronics, print line buffer and universal character set feature and the logic, error checking and control functions needed to operate the IBM 1403.

With the appropriate data and control lines the M403 controller can be interfaced to almost any computer, and to peripherals, the firm said.

Macro Products Corp.'s mailing address is P.O. Box 2807, 90230.

Five Double Density Disk Drive Methods Outlined

By J.E. Braun
Special to Computerworld

With the advent of double-capacity 2314-compatible disk drives, IBM 360/370 users can reduce the cost of disk storage with minimal, if any, degradation in performance.

The ability of a 2316 disk pack to store 58 million bytes instead of 29 million has been referred to as double density, double capacity and dual-cylinder density. This increase in storage capacity requires a physical change in the data recording techniques. Of prime concern in the double density environment is the ability to execute existing system and application software without modification.

There are five basic physical methods that double the capacity of a 2316 disk.

The first method is accomplished by reducing the rotational speed of the disk by one half, thereby allowing for doubling the data recording density. This method requires software modifications to existing operating systems.

The rotational speed is reduced to 1,200 rpm, which effectively doubles the recording capacity of the track. The major problem with this method is that the latency time is doubled. The average search time increases from 12.5 msec to 25 msec.

Upon examination of the seek timing graph, it can be seen that the time frame required by a search when using this method can be better used for both a two-cylinder move and a search when using the other methods.

Viewpoint

Before deciding to use a drive of this type, a search monitoring program should be used to determine the effect of potentially doubling the search time.

The second method does not alter the rotational speed of the disk, but it does double the recording density. This method increases the I/O transfer rate to 624K byte/sec and is, therefore, limited to 360/65s and above. This method alleviates the problem of increased search time, but pack criteria, as with method one, must be evaluated closely.

406 Cylinders

The third method uses a device with 406 cylinders. The data management and I/O routines in the system software must be modified to use the space available; i.e., space availability is determined by examining the VTOC (volume table of contents) and using a base of 203 cylinders for necessary calculations. Other modifications are required to access methods and I/O supervision.

The fourth method uses 406 cylinders also, but divides them into two logical halves.

Upon examination of this technique, it appears that the first logical unit will provide faster access to data due to the reduced disk surface. This would indicate that by placing a high activity data set on the first logical unit and a low activity data set on the second logical unit data acquisitioning time would be optimized.

After studying a seek timing graph, however, this method appears less attractive because of the time required to traverse 200 cylinders. Around 80% of the arm-positioning time is expended in traversing the first 200 cylinders.

This, therefore, reduces the possibility for improving data acquisition even though 203 cylinders reside in the first half of the pack.

When two data sets of equal activity (low or high) are on the same physical pack, an arm-repositioning problem results if an efficient data organization to reduce such repositioning is not employed. For example, if the VTOC is accessed by both logical units, an 80% time loss occurs. This can be reduced if the VTOC is on cylinder 199 for the first logical unit and on cylinder 0 for the second logical unit.

The effect of having nonstandard VTOCs must now be evaluated to determine the depth of system and operation repercussions.

The fifth method also uses 406 cylinders that are divided into two logical units, each containing 203 cylinders. The cylinders in this method are interleaved rather than split into two contiguous segments.

By interleaving the cylinders, data sets can be physically placed for optimum access time. If two data sets with equal activity (low or high) are located on each logical unit, their centers of seek activity can be overlapped to reduce positioning time.

This method makes it possible for a single arm to provide faster access than access by two separate arms. For example, if logical unit 0 required access to the VTOC, the arm would be moved to the cylinder containing the VTOC. Then logical unit 1 would have only a one-cylinder move to access the VTOC.

The logical unit 1 has a time frame of a one-cylinder move because logical unit 0 absorbed the time for moving the arm to the VTOC area. The reverse of this can also occur; rather than moving the arm closer to the cylinder of the other logical unit, this method could cause the arm to move farther away. This would then degrade access.

Statistical Law

By using the statistical Law of Large Numbers, it can be seen that the effects of arm repositioning will be negated for files having a direct-access organization with random requests, and, therefore little or no access degradation will occur.

The fifth method is the only one that can read packs that were written on single-density drives. This is a very powerful feature for file conversion and provides some compatibility.

Some areas that will be enhanced by the double density are as follows:

- Sequential or indexed sequential multivolumed files
- Large data bases with a low activity rate
- Large data bases with a high activity rate and a noncritical response time.
- Applications requiring large data bases online
- Applications not generating many overlapped seeks
- Applications requiring few pack mounts/dismounts.

One of the most important criteria that should be used to determine the feasibility of using a double-capacity system is that of software modifications.

J.E. Braun is a senior programmer at Calcomp.

Peripherals and Mainframe Makers To Share in Navy Procurement Plans

WASHINGTON, D.C. – The Department of the Navy is planning at least 12 computer procurements during the next calendar year.

In a forecast of future purchases, the Navy's Automatic Data Processing Equipment Selection Office offers several goodies to independent peripheral manufacturers along with key-to-disk makers and mainframe companies.

During the first quarter of 1972, the forecast said that the Office of Naval Research will issue a bid for the replacement of two Control Data 3800s with one large system.

Also in the first quarter, the Naval Supply Systems Command will replace a number of Univac Fastrand II drums with compatible devices, and a bid will be issued calling for the replacement of 16 IBM 2420 series tape drives with plug-to-plug compatible units. This second bid will carry an option for eight additional units.

The final procurement planned for the first three months will involve the acquisition of a small scale computer at the Naval Reserve Training Command in Omaha, Neb.

During the second quarter the Department of Defense Computer Institute will purchase one small system and numerical control systems will be purchased for each of the seven Naval Air Rework Facilities.

Thirty Terminals

Thirty data collection terminals, plus one minicomputer with peripherals will be purchased for a Source Data Automation System for the Naval Ordnance Station in Louisville, Ky., during the quarter.

The final procurement of the second quarter will be a mini for the Bureau of Medicine and Surgery. This bid will carry a possible option for up to 13 additional systems for use in Naval hospitals.

During the third quarter, the Chief of Naval Air Training Command will acquire one medium scale computer and the Naval Air Systems Command will replace three IBM 7094s, one IBM 360/30 and one IBM 360/40 with one or more large scale computer systems.

In the fourth quarter the Chief of Naval Operations will replace keypunch and key verify equipment with key-to-disk entry systems at "selected" Naval installations, the report said.

The last procurement currently on the schedule will call for the replacement of an IBM 360/50 with a large scale system by the Naval Facilities Engineering Command.

Mini Market Growth Seen 25% With Communications Up 66%

OCEANPORT, N.J. – The small computer industry will grow about 25% in 1972, reaching a gross sales figure somewhere in the neighborhood of $300 million, according to Donald Sinnott, president of Interdata, Inc.

Of that $300 million worth of minicomputers, the biggest percentage growth compared with 1971 comes from data communications applications. That will jump about 66%, from $38 million in 1971 to $64 million.

Industrial control applications will develop more modestly, from $101 million in 1971 to $123 million in 1972. And laboratory instrumentation applications will be virtually flat, going from $63 million in 1971 to $66 million in 1972. All other minicomputer applications will rise from $38 million in 1971 to $48 million in 1972.

Overseas markets, particularly Germany, will assume a greater importance in 1972 for the small computer industry, he said. The use of dedicated minicomputers for industrial control and data communications purposes will significantly increase in Europe in 1972, he added.

Contracts

McDonnell Douglas Automation Co. will provide credit union data processing services for five years to Cunadata Corp., Madison, Wis. Participating unions will be linked to a 370/165 in Long Beach, Calif., via McDonnell Douglas' telecommunications network. Revenues are expected to reach $4.5 million at the end of the period.

Executive Data Systems has contracted to provide DP services for St. Mary's Hospital, Pierre, S.D., and McNamara Hospital, Rapid City, S.D.

Logicon, Inc. has received two new government contracts totalling more than $4 million for software associated with the Minuteman Intercontinental Ballistic Missile.

Documentor Sciences Corp., Santa Ana, Calif., has received orders from Gino's Inc. and another fast-food organization for its Documentor point-of-sale system.

PRC Information Sciences Co. has been awarded a $203,000 contract from the U.S. Department of Labor to develop an occupational safety and health management information system that will provide organized channels of communication between the Secretary of Labor and regional and area offices.

Computing and Software, Inc. has landed a $1.7 million contract from Nasa to "receive, process, store and distribute copies of data collected" from the Goddard Earth Resources Technology Satellite Program.

TRW Inc. will install Safer II, a real-time computerized traffic control system in Boulder, Colo. The system can control up to 100 intersections.

Computer Science Corp. has a $1.7 million award for programming and software support required for operation of the Safeguard Management Information System.

Tele-Signal Operation of Kearfott Division, The Singer Co. has received an order from Western Union Data Services for 900 of its Model 881C data sets, used to connect a Model 33 or 35 Teletypewriter to the TWX or Data Phone Network.

TRW Systems Group has been awarded a nine-month contract by the Communications Satellite Corp. (Comsat) for programming related to consideration of possible future satellite communications applications.

Computer Technology Inc. has received a three-year facilities management contract from Michigan Automobile Insurance Placement Facility. The agreement calls for CT to process all information and materials related to a computerized installment payment program previously developed by CT.

The Air Force Electronic Systems Division has issued System Development Corp. a $19 million modification of a previously awarded contract for software for Tactical Information Processing and Interpretation System (Tipi).

Effect of DP Withdrawal

RCA Declares $155 Million Loss

NEW YORK – RCA's withdrawal from the computer field will result in an overall loss of about $155 million for 1971, Chairman Robert W. Sarnoff disclosed.

In 1970, net income totaled $91.7 million, or $1.26 a share, on sales of $3.3 billion.

Profit from RCA's continuing operations will be about $130 million, an increase of about 21% over the $107 million earned in strike-affected 1970, Sarnoff said. Sales from continuing operations will total approximately $3.5 billion, about 5% over last year's $3.3 billion.

RCA's decision to withdraw entailed an extraordinary charge of $490 million, which was tempered by an estimated tax recovery of $240 million and resulted in a one-time after-tax charge of $250 million. This, and the net operating loss of the discontinued operations, will produce an overall loss of about $155 million for 1971, he reported.

Both old and new businesses contributed to improvements in RCA's continuing operations.

The impact of the computer decision was tempered to a degree by the changes in RCA itself over the past six years, Sarnoff noted. "Our operating base has been broadened, we have entered new businesses through internal expansion and acquisition, and we have achieved a balance between manufacturing and service activities.

"As a group," he continued, "the companies acquired by RCA during this period have outperformed our traditional businesses, which have been affected more severely by the general economic slowdown."

A "primary objective of management now is to alter the shape of the company's growth curve, which has historically followed a cyclical pattern, accelerating with the introduction of such new products as black-and-white and color television and tapering off as the markets matured. Today, RCA seeks a more consistent long-term sales and profit expansion," Sarnoff declared.

Nickels & Dimes

Farrington Manufacturing Co. and two subsidiaries, **Farrington Electronics Inc.** and **Farrington Overseas Corp.**, were ruled insolvent by Federal District Court in Alexandria, Va. The action precludes participation by current stockholders of Farrington in any plan of reorganization or distribution of assets, according to John W. Davidge Jr., trustee in reorganization. Farrington filed for reorganization under Chapter 10 in December 1970.

$$$

TEC, Inc. has compiled a whopping 300% increase in earnings for the six months ended Oct. 31. Earnings totaled $61,350 or 9 cents a share on sales of $2.1 million. In the period last year, earnings for the CRT and components maker were $15,234 or 2 cents per share on sales of $2.2 million.

$$$

Towards the end of the year, several companies decided to visit their bankers.

Electronic Memories & Magnetics reduced its long-term bank credit line from $20 million to $8 million.

Tracor renewed and extended its $26 million line of credit due March 1.

Itel arranged a new $75 million line of credit for financing the leasing of its peripheral equipment manufactured by its ISS subsidiary. The agreement extends through 1976.

Data 100 obtained a $5 million revolving credit and term loan agreement with the same three banks with which it had a prior agreement involving a $2 million limit ending July 31.

$$$

In a different kind of financing, **Applied Logic** shareholders ratified a major recapitalization agreement and a one share for five reverse stock split. Under the agreement major creditors have forgiven about one-third of the firm's overall debt in exchange for common stock.

$$$

Computer Servicenters is showing black ink, a change from last year. Earnings for the year ending Aug. 31 were $50,262, or 1 cent per share, compared with last year's loss of $1.8 million or 47 cents per share.

TRADE*QUOTES®

Computerworld Stock Trading Summary

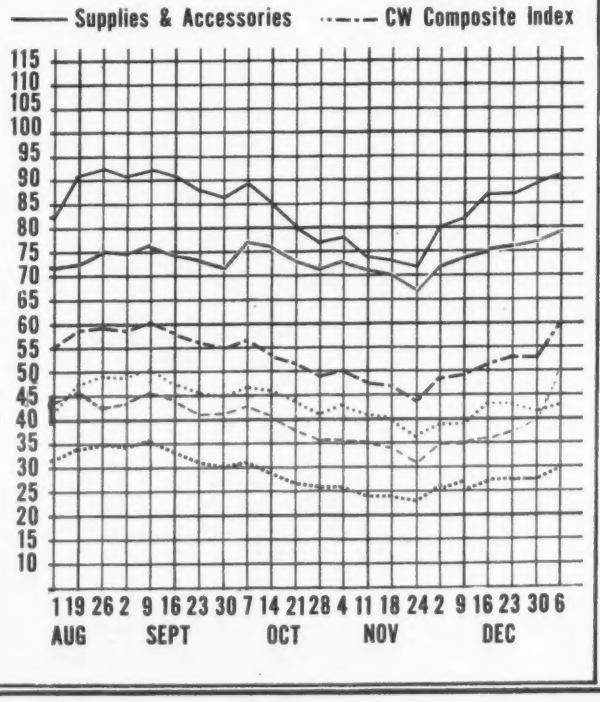
All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

CLOSING PRICES THURSDAY, JANUARY 6, 1972

EXCH		1971 RANGE (1)	CLOSE JAN 6 1971	2 WEEK NET CHNGE	2 WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 4	1 1/8	+ 1/8	+12.5
A	APPLIED DATA RES.	5- 13	5 3/4	+ 1/4	+4.5
O	APPLIED LOGIC	1- 3	3	+2 3/4	+1100.0
N	AUTOMATIC DATA PROC	44- 78	73 1/4	-1 1/2	-2.0
O	AUTO SCIENCES	1- 8	3/8	+ 1/8	+50.0
O	COMPUTER NETWORK	2- 11	6 3/4	- 1/4	-3.5
O	COMPUTER PROPERTY	5- 11	5	- 3/8	-6.9
N	COMPUTER SCIENCES	6- 17	8 3/8	- 1/8	-1.4
O	COMPUTER TECHNOLOGY	4- 11	6 5/8	+ 3/8	+6.0
O	COMPUTER USAGE	5- 16	9	+ 5/8	+7.4
O	COMP AUTOMOT REPORTS	6- 13	7 1/4	+ 1/4	+3.5
N	COMPUTING & SOFTWARE	17- 45	22 3/4	+ 1/8	+0.5
O	COMRESS	1- 4	1 3/8	- 1/8	-8.3
O	COMSHARE	4- 8	5 3/4	0	0.0
O	DATA AUTOMATION	1- 4	1/2	0	0.0
O	DATA PACKAGING	6- 10	6 1/8	- 1/8	-2.0
O	DATAMATION SERVICE	1- 3	1/2	+ 1/8	+33.3
L	DATATAB	4- 10	8 1/2	+1 1/8	+15.2
O	EDP RESOURCES	5- 16	7 5/8	+2 3/8	+45.2
A	ELECT COMP PROG	2- 7	3 3/8	+1 1/8	+50.0
N	ELECTRONIC DATA SYS.	34- 85	52	+6 1/2	+14.2
O	INFORMATICS	6- 15	9 1/8	+ 1/8	+1.3
O	I.O.A. DATA CORP	1- 3	1 1/4	+ 1/4	+25.0
A	ITEL	7- 23	9 7/8	+ 1/4	+2.5
O	KEANE ASSOCIATES	4- 14	5 1/2	+1	+22.2
O	KEYDATA CORP	5- 14	6 3/4	+ 1/8	+1.8
A	MANAGEMENT DATA	5- 11	6 5/8	+ 1/2	+8.1
O	NATIONAL CSS INC	7- 14	8 3/4	+1 3/4	+25.0
O	NAT COMP ANALYSTS	1- 4	5/8	+ 1/4	+66.6
P	ON LINE SYSTEMS INC	7- 18	10 1/4	+1 3/4	+20.5
N	PLANNING RESEARCH	10- 26	14 3/8	0	0.0
O	PROGRAMMING METHODS	16- 29	23 1/4	+1 1/4	+5.6
O	PROGRAMMING & SYS	1- 4	1 7/8	+ 1/2	+36.3
O	SCIENTIFIC COMPUTERS	2- 4	3 5/8	+1 1/8	+45.0
O	SIMPLICITY COMPUTER	1- 4	3 1/8	0	0.0
O	SOFTWARE SYSTEMS	1- 3	7/8	- 1/8	-12.5
O	TBS COMPUTER CENTERS	4- 9	3 7/8	+ 1/8	+3.3
O	TOLLEY INTL CORP	3- 8	7 1/4	- 1/2	-6.4
O	TRACOR COMPUTING	2- 5	2 1/2	+ 1/4	+11.1
O	TYMSHARE INC	4- 15	8 1/4	+ 1/4	+3.1
O	UNITED DATA CENTER	2- 7	4 3/4	- 1/2	-9.5
N	UNIVERSITY COMPUTING	14- 38	21 3/8	+1 1/8	+5.5
A	URS SYSTEMS	5- 11	7 1/8	+ 1/2	+7.5
O	VORTEX CORP	2- 6	4 3/4	- 3/4	-13.6
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	24- 48	35 5/8	+2 1/8	+6.3
O	ALPHANUMERIC	1- 6	7/8	+ 1/8	+16.6
N	AMPEX CORP	12- 25	14 3/4	+1 5/8	+12.3
O	ANDERSON JACOBSON	5- 10	5 1/2	+ 1/8	+2.3
O	ATLANTIC TECHNOLOGY	3- 8	3 1/8	+ 5/8	+25.0
A	BOLT,BERANEK & NEW	4- 8	6 7/8	+1 3/4	+34.1
N	BUNKER-RAMO	6- 17	9 1/4	+1 1/8	+13.8
A	CALCOMP	14- 33	19 1/2	-1	-4.8
O	COGNITRONICS	2- 9	3 1/4	- 3/4	-18.7
O	COLORADO INSTRUMENTS	2- 8	2	+ 1/2	+33.3
O	COMPUTER COMMUN.	5- 19	6 1/4	+ 3/4	+13.6
A	COMPUTER EQUIPMENT	3- 7	3 1/2	0	0.0
A	COMPUTEST	4- 20	6	- 1/2	-7.6
O	CONSOL COMPUTER LTD.	1- 12	1/2	- 5/8	-55.5
A	DATA PRODUCTS CORP	3- 10	5 3/4	+1 3/8	+31.4
O	DATA RECOGNITION	3- 8	4 1/4	+ 1/2	+13.3
O	DATA TECHNOLOGY	3- 9	3 7/8	+ 1/4	+6.8
O	DIGITRONICS	2- 8	3 1/4	+ 1/8	+4.0
N	ELECTRONIC M & M	5- 16	6 7/8	0	0.0
O	FABRI-TEK	2- 4	2 1/4	+ 1/2	+28.5
O	GENERAL COMPUTER SYS	6- 10	7 3/4	+ 1/4	+3.3
N	GENERAL ELECTRIC	53-124	63 3/4	- 3/4	-1.1
O	INFOREX INC	17- 49	30 1/2	+3 3/4	+14.0
O	INFORMATION DISPLAYS	3- 8	5	- 1/8	-2.4
O	MANAGEMENT ASSIST	1- 2	7/8	+ 1/4	+40.0
A	MARSHALL INDUSTRIES	7- 27	9 5/8	- 3/4	-7.2
N	MEMOREX	20- 78	31 1/2	-1	-3.0
A	MILGO ELECTRONICS	12- 26	16 3/4	- 5/8	-3.5
N	MOHAWK DATA SCI	15- 47	22 1/4	+1 1/4	+5.9
O	OPTICAL SCANNING	6- 18	9 1/8	+2 1/8	+30.3
O	PHOTON	6- 12	8 1/2	+1 1/4	+17.2
A	POTTER INSTRUMENT	11- 25	15 3/8	+ 3/8	+2.5
O	PRECISION INST.	7- 16	9 5/8	+1 7/8	+24.1
O	RECOGNITION EQUIP	9- 26	12 3/8	+2	+19.2
O	REDCOR CORP.	1- 9	2	+ 1/4	+14.2
N	SANDERS ASSOCIATES	9- 22	15 3/4	+3	+23.5
O	SCAN DATA	6- 15	11 1/2	+1 3/8	+13.5
O	TALLY CORP.	6- 16	8 1/2	+ 1/2	+6.2
N	TELEX	8- 22	12	- 3/4	-5.8
	SUPPLIES & ACCESSORIES				
N	ADAMS-MILLIS CORP	9- 19	12 1/4	+1 7/8	+18.0
O	BALTIMORE BUS FORMS	6- 10	6 3/4	- 1/2	-6.8
A	BARRY WRIGHT	7- 13	9 3/8	+ 1/8	+1.3
A	DATA DOCUMENTS	14- 29	19	+1 1/2	+8.5
O	DUPLEX PRODUCTS INC	8- 13	12 1/4	0	0.0
N	ENNIS BUS. FORMS	5- 13	7 1/2	+ 3/8	+5.2
O	GRAHAM MAGNETICS	9- 35	16	+1 1/8	+7.5
O	GRAPHIC CONTROLS	6- 15	13 3/4	+1 1/2	+12.2
N	3M COMPANY	96-135	133 1/2	+3 1/4	+2.4
O	MOORE BUS. FORMS	36- 43	43	+ 1/2	+1.1
N	NASHUA CORP	20- 50	48 5/8	- 3/8	-0.7
O	REYNOLDS & REYNOLD	37- 63	59 1/2	-1	-1.6
O	STANDARD REGISTER	14- 23	17 3/4	+1 1/4	+7.5
O	TAB PRODUCTS CO	8- 17	14 1/4	- 3/4	-5.0
N	UARCO	23- 34	23	-2 5/8	-10.2
A	WABASH MAGNETICS	5- 10	8	+1 1/4	+18.5
N	WALLACE BUS FORMS	18- 26	23 3/8	0	0.0
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	105-160	154 1/2	+2 1/4	+1.4
N	COLLINS RADIO	10- 20	15 3/8	+2 1/4	+17.1
N	CONTROL DATA CORP	34- 83	47	+1 1/2	+3.2
O	DATA GENERAL CORP	19- 65	59	+3	+5.3
O	DIGITAL COMP CONTROL	4- 24	15 1/4	+ 1/2	+3.3
N	DIGITAL EQUIPMENT	53- 85	76 1/4	- 3/4	-0.9
N	ELECTRONIC ASSOC.	5- 9	6 1/8	+ 3/4	+13.9
A	ELECTRONIC ENGINEER.	5- 10	9	+1 1/2	+20.0
N	FOXBORO	25- 46	36 1/8	+2 3/8	+7.0
O	GENERAL AUTOMATION	9- 26	13 1/2	+1 3/4	+14.8
N	HEWLETT-PACKARD CO	30- 50	46 7/8	+ 3/8	+0.8
N	HONEYWELL INC	83-137	131 1/2	+ 7/8	+0.6
N	IBM	284-364	341	+5	+1.4
O	INTERDATA INC	6- 11	8 1/8	- 1/8	-1.5
N	NCR	25- 49	29 3/4	+ 7/8	+3.0
N	RCA	26- 41	38 3/4	+1 5/8	+4.3
N	RAYTHEON CO	27- 46	40 1/8	+ 7/8	+2.2
N	SPERRY RAND	23- 38	32	+ 3/4	+2.3
A	SYSTEMS ENG. LABS	7- 18	11 1/8	+1 3/8	+14.1
N	VARIAN ASSOCIATES	11- 18	14 3/4	+1 1/2	+11.3
N	VICTOR COMPTOMETER	12- 27	16 5/8	+ 7/8	+5.5
N	WANG LABS.	29- 50	40 1/8	-2 3/8	-5.5
N	XEROX CORP	85-127	125 3/4	+ 1/4	+0.1
	LEASING COMPANIES				
A	BOOTHE COMPUTER	11- 27	14 1/8	+ 1/4	+1.8
O	BRESNAHAN COMP.	2- 4	2 3/8	0	0.0
O	COMPUTER EXCHANGE	1- 9	2	+ 1/8	+6.6
A	COMPUTER INVSTRS GRP	7- 14	8 3/8	+ 3/8	+4.6
N	DPF INC	8- 19	9 3/4	- 1/4	-2.5
O	DATRONIC RENTAL	2- 4	2 3/8	- 1/8	-5.0
A	DCL INC	5- 13	8	0	0.0
A	DEARBORN-STORM	12- 23	20	-3	-13.0
A	DPA, INC.	4- 9	5 1/4	-2 1/4	-30.0
A	GRANITE MGT	7- 13	8 1/2	- 1/4	-2.8
A	GREYHOUND COMPUTER	7- 11	8 1/4	+ 1/8	+1.5
N	LEASCO CORP	16- 26	21 1/2	+ 1/2	+2.3
O	LECTRO MGT INC	2- 5	2 1/2	0	0.0
O	NCC INDUSTRIES	3- 9	9 1/4	+1 1/8	+13.8
A	ROCKWOOD COMPUTER	3- 9	4 1/8	+ 1/2	+13.7
O	SYSTEMS CAPITAL	3- 7	3@3/8	0	0.0
N	U.S. LEASING	10- 39	36 3/4	- 3/4	-2.0

EXCH: N=NEW YORK EXCHANGE; A=AMERICAN EXCHANGE
L=NATIONAL EXCHANGE; O=OVER-THE-COUNTER
P=PHIL-BALT-WASH
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Computer Stocks Trading Index



Earnings Reports

ELECTRONIC ASSISTANCE
Nine Months Ended Oct. 31

	1971	1970
Shr Ernd	a$.11	$.09
Revenue	27,712,000	22,008,000
Spec Cred	b35,000	.....
Earnings	c245,000	176,000

a-Based on income before special credit. b-Gain on sale of fixed assets. c-Equal to 13 cents a share.

PROGRAMMED PROPRIETARY SYSTEMS
Three Months Ended Aug. 31

	1971	1970
aRevenue	$205,118	$202,273
Loss	38,601	80,760

a-From continuing operations and including franchise revenues.

GENERAL AUTOMATION
Three Months Ended Oct. 31

	1971	1970
Shr Ernd	a$.06	.....
Revenue	2,877,311	$2,350,000
Tax Cred	105,000	.....
Earnings (Loss)	b209,174	(173,000)

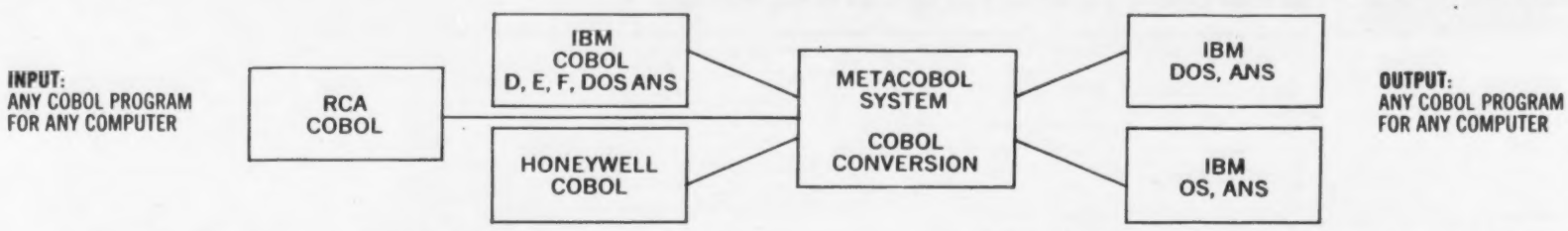
a-Based on income before tax credit. b-Equal to 12 cents a share.

CONTROL DATA
Three Months Ended Sept. 30

	a1971	b1970
cShr Ernd	$.07	$.26
Revenue	123,064,000	132,433,000
Loss Par Co	9,785,000	4,347,000
Comm Cred	12,400,000	9,532,000
eLoss Affil	1,258,000	1,082,000
Spec Items	d203,000	f322,000
gEarnings	1,154,000	4,425,000
c9 Mo Shr	1.72	.34
Revenue	405,172,000	401,779,000
Loss Par Co	8,834,000	16,629,000
Comm Cred	38,299,000	26,299,000
eLoss Affil	3,439,000	3,605,000
Spec Cred	322,000	253,000
gEarnings	26,348,000	6,318,000

a-As of Jan. 1, 1971, the company extended the depreciable life of certain computer equipment from four to five and six years. This change had the effect of increasing net income for the nine months ended Sept. 30, 1971 by approximately $5,800,000, or 40 cents a share. b-Restated to include company's equity in the net loss of approximately 50%-owned affiliates. c-Based on income before special items. d-Debit. e-From approximately 50%-owned affiliates. f-Credit. g-Equal to 5 cents a share in the quarter and $1.74 a share in the nine months of 1971, compared with 28 cents a share and 36 cents a share, respectively, in the like periods of 1970.

MetaCOBOL™ is helping IBM, RCA, and Honeywell users change for the better, better.



Translate COBOL programs to IBM ANS COBOL without affecting the original integrity.

The MetaCOBOL conversion procedures (a set of ADR supplied MetaCOBOL "macros" easily adapted and tailored by a user) are designed to perform without affecting the integrity of the original program. Diagnostics are produced when a need to translate becomes evident and the solution depends on a customer's mode of operation. The customer can then make the changes manually or modify the MetaCOBOL procedures to his requirements.

The five essential functions of the basic MetaCOBOL conversion procedures are:

Protection against use of a name that conflicts with an ANS COBOL reserved word. Some words used as data and procedure names within COBOL have a reserved meaning under ANS. These will be diagnosed and changed to a hyphenated format. Examples of such terms are START and TIME-OF-DAY.

Simple syntax translation of words and phrases. Simple statements which are often oriented to other COBOL levels are changed to IBM ANS equivalents. For instance, references to RCA-SPECTRA, or HONEYWELL 200 are changed to IBM-360; COPY and INCLUDE statements are changed to COPY with the quotes removed from the external name; COMPUTATIONAL fields are SYNCHRONIZED; ENTER LINKAGE and ENTER COBOL are removed; etc. Most simple syntax changes **do not** produce diagnostics.

Complex syntax translation. Complex syntax changes to IBM ANS format are performed wherever possible. Examples include conversion of the SELECT, APPLY, SAME and RERUN clauses in the ENVIRONMENT DIVISION and reformatting of DECLARATIVE USE clauses of the PROCEDURE DIVISION. If conversion is to OS as well as ANS, UNIT-RECORD files are changed to utility. RESERVE clauses are dropped, BLOCK CONTAINS 0 RECORDS clauses are inserted, and device types are purged. These can then be specified through JCL at execution time. Most complex syntax changes are accompanied by messages annotating the alterations.

Complete syntax analysis These are a number of conditions diagnosed as necessary changes without being altered by the basic conversion procedures. Often the MetaCOBOL user can decide upon a standard and modify the procedures automatically. In other cases, a manual modification of logic would result in a cleaner solution. Some examples of such situations are checks for the printer end-of-form which should be changed to line-counting logic, and numeric class tests of items not defined as signed numeric which should be redefined as such.

End-of-conversion analysis. A number of displays can be produced at the end of the conversion run: counts of critical verbs (such as ACCEPT, DISPLAY, EXHIBIT, SORT, STOP literal, IF form-overflow, IF NUMERIC and TALLY.) The attributes of all records within the FILE SECTION can be displayed in a special DMAP. Advisory JCL listings can be produced to ease the burden of preparing JCL for testing and operation. Honeywell conversion procedures list data names which require VALUE clauses in working-storage.

As with most MetaCOBOL procedures, ADR encourages customers to adapt the basic procedure sets according to their own requirements.

Other uses of MetaCOBOL in a conversion environment.

Program checkout of converted programs. The converted program can be submitted to the MetaCOBOL Test Data Generator in order to produce the test data required for checkout.

The MetaCOBOL Run-time Debugging Aid can be used to debug the converted program in the context of its new environment and to document the adequacy of testing.

The MetaCOBOL COBOL Performance Monitor can be used to point out areas of potential improvement within the operational environment.

Improved clarity. The MetaCOBOL System can improve the documentational quality of data and procedure names used throughout the program, as well as guarantee adherence to installation standards. These tasks can be performed during the same pass as the conversion, or in a separate pass.

Program enhancements. There are a number of available MetaCOBOL procedures to facilitate maintenance efforts, improve the operational environment, etc. One example is the Paragraph Numbering Procedure, which consecutively numbers procedure names within an existing COBOL program for ease of reference.

Another example is the Systems Management Procedure, which embeds operational accounting logic within an OS/ANS COBOL program by program name, file name, time, date, and counts of reads/writes. Periodically, the file created by this embedded logic can be displayed in various sequences to determine program and file activity. As a result of such analysis, the operations department can improve job mix and file allocation. (For instance, a disk master file with very little activity might be changed to a tape file, whereas a tape file with high activity might be made disk-resident.)

File conversion. A common post-program conversion problem is file conversion. Files created by lower-level COBOL programs may not be compatible with ANS COBOL. For instance, lower-level compilers are typically less rigid than ANS COBOL concerning sign conventions of data areas defined as signed numeric. If such a field is included within a group definition for comparison purposes, the compiler generates a compare logical instruction. Older versions often carry signed numerics as unsigned. ANS forces a positive sign. Therefore, unequal comparison results. With MetaCOBOL's translator an ADD +0 instruction can be generated to force a positive sign into fields described as signed numeric, guaranteeing file integrity. And saving valuable time.

When conversion is finished, MetaCOBOL just begins.

Conversion from one COBOL compiler to another is one of the many justifications for MetaCOBOL. Coding, testing, standardization, debugging, and evaluation of COBOL programs are other uses of this adaptable software package. All on the IBM/360, under OS or DOS.

For complete information on how MetaCOBOL can solve your conversion problems, and, cut program development costs and time, mail us the coupon. Or call any ADR office listed below.

Then make your change for the better. Faster, more accurately. With MetaCOBOL

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